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AIR CONDITIONING & REFRIGERATION News

THE NEWSPAPER OF THE INDUSTRY

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DETROIT

INSIDE DOPE

by GEORGE F. TAUBENECK

Stories of the Week
Gag of the Week
What's Ahead for Our Industry?
Grounds for Optimism
Raw Materials and Prices
Bureaucratic Troubles
Need for Small Plants
Inafued Seal
Ten Mistakes of Life
Good News

Stories of the Week

Around the National Press club in Washington the buckoes are telling this story to non-resident members. Said to be true, too.

A newsstand proprietor had just opened up when he saw Truman walking briskly up the street. Flanked by S.S. men, H.S.T. was out for his regular morning exercise.

That day the headlines were devoted to impeachment possibilities. Thinking quickly, the newsie grabbed a copy of the Racing Form from his rack, and thrust it out as the President strode by.

"Today's odds, sir?" he proffered.

L. G. Jacques, executive vice president of Motor Products Corp., Deepfreeze's parent company, tells of this conversation between two waiters in a club car.

"What's this inflation business I hear everybody talking about?" queried one white-coat.

"Well, I'll explain it to you," answered the other. "Used to be that every dollar issued by the government had to be backed by a dollar's worth of gold in Fort Knox. Now, every dollar is worth 25 cents in gold and 75 cents in powdered eggs. That's inflation!"

Gag of the Week

According to Berlin correspondents who have friends in the National Press club, a thug recently cracked a safe in the office of the Eastern Germany Propaganda Chief. In addition to a handful of counterfeit marks and an old pair of shoes, he got away with the results of the next election.

What's Ahead for Our Industry?

Knowing full well that air conditioning is vitally useful and even indispensable in wartime—but realizing that few people understand why and how that is true—"Dope" has participated in several recent Washington conferences with considerable trepidation and uncertainty.

Together with representative editors of the business press, we have interviewed:

Charles E. Wilson, Director of Defense Mobilization.

Sydney Weinberg, Wilson's "special assistant."

Manley Fleischmann, head man of the National Production Authority.

Eric Johnston, Economic Stabilization Administrator.

Michael Di Salle, Chief of the Office of Price Administration.

Dean Rusk, Assistant Secretary of State for Far Eastern Affairs.

Hugh Clegg, Assistant Director of the F.B.I.

PLUS a number of Senators, Congressmen, and Pentagon "brass."

All these interviews were "off the record," and none of the gentlemen named can be quoted. However, we can try to crystallize some of the things they said which bear on "what's ahead."

Grounds for Optimism

In the first place, nobody *in authority* seems to think Russia will strike us this year. Rather, it is expected that satellites of the Kremlin will continue to harass us in "diversions" similar to the Korean affair.

Secondly, genuine fear of a World War III in 1952 or 1953 is prevalent among some "informed circles." There were hints that MacArthur could be proved right by the course of events. There were other hints that the British appeasement policy

(Concluded on Page 8, Column 1)

Air Conditioning --Vital to America

The day is gone when mechanical refrigeration and air conditioning could be considered a luxury.

Today it is an undeniable—though sometimes poorly understood—fact that refrigeration and air conditioning are vital to America—particularly in their commercial and industrial applications.

This special issue of AIR CONDITIONING & REFRIGERATION NEWS will give you some idea of the role this industry plays in preparing this country's defenses.

A broader view is ably presented in a booklet compiled in a joint effort of the Air Conditioning & Refrigerating Machinery Association, the Refrigeration Equipment Manufacturers Association, and the Commercial Refrigerator Manufacturers Association. It covers the commercial and industrial refrigeration and air conditioning contributions to the nation's welfare in both peace and war.

Through pictures and text (it takes only about 10 minutes to go through the whole presentation), it shows the essential contributions made:

1. Food distribution
2. Public health and hospitals
3. Industrial processes
4. Research and development
5. Civilian defense
6. Military operations

"Refrigeration or air conditioning," it points out, "or both are required for processing or preserving about 77% by weight of the annual diet of the average American."

In the food industries, refrigeration and air conditioning are employed in processing, storage, transportation, and merchandising. Temperature control is an important factor in handling frozen foods, meat, poultry, eggs, dairy products, vegetables, fruits, bakery products, beverages, and fish.

In public health, the role of temperature control in checking the spread of diseases and food poisoning is so well known that it is hardly thought of. But it does its job day in and day out just the same.

Hospitals are constantly finding new uses for refrigeration and air conditioning, not only in patient care, but in the development of new medicines and treatments.

In industry, aside from the very important human factor, air conditioning and refrigeration, the booklet notes, is used to increase production, to store and prepare raw materials, to improve quality, and to assure accuracy and close tolerances formerly unheard of.

For instance, look at the improvements that air conditioning and refrigeration have brought to such industries as mining and metals, steel, machine tools and metalworking, aircraft, automotive equipment, electrical products, communications, pharmaceuticals, chemicals, powder and explosives, plastics, rubber, textiles, petroleum, opticals, photography, and atomic fission.

The control of temperature and humidity is a vital aid to the army of scientists who are searching

(Concluded on Page 4, Column 2)

Proposal To License Journeymen Dropped From Detroit Code

DETROIT — The provision which would have required licensing of journeymen was thrown out of Detroit's proposed refrigeration code by the study committee at its first meeting April 19.

At the same time the committee tentatively approved adoption by reference of the ASA-B9 (1950 edition) safety code for mechanical refrigeration with two changes.

Recommendations made by the study committee will be incorporated in another draft for further study. When the proposed ordinance is finally approved by the committee members and has won the legal approval of the city's corporation counsel, it will be submitted to the Common Council of Detroit. Affirmative vote of the latter governing body is required before the proposed ordinance becomes a law.

One of the most lively discussions

(Concluded on Page 41, Column 1)

Sparks-Withington To Offer Refrigerators

JACKSON, Mich. — Henry L. Pierce, general sales manager of the Radio-Television division of The Sparks-Withington Co., has announced that his company will soon offer a short line of household electric refrigerators to Sparton's exclusive dealers operating under the Sparton Cooperative Merchandising Plan.

For the time being, Sparton dealers will be offered only two models, but at highly competitive discounts.

The two models will be a 9-ft. and

(Concluded on Page 41, Column 5)

What This Issue Is All About

Readers will note that the editorial matter in this Special Issue is heavily concentrated on the subject of air conditioning.

It was planned that way, for the reasons stated above—the fact that it is an undeniable—though sometimes poorly understood—fact that air conditioning is vital to America. It is the purpose of this issue to demonstrate how air conditioning is vital to the defense, general welfare, good health, and high productive activity of this nation.

May 30 Is New Deadline For Filing Pricing Charts

WASHINGTON, D. C. — Deadline for filing dealer pricing charts required by Ceiling Price Regulation 7 has been extended to May 30, the Office of Price Stabilization has announced.

Charts must be filed before retailers may use ceiling prices based on the margin type control. Until such time they must continue under the General Ceiling Price Regulation which sets their ceiling at their highest delivered price between Dec. 19, 1950 and Jan. 25, 1951.

Rema To Elect New Officers This Week

HOT SPRINGS, Va.—Annual meeting of the Refrigeration Equipment Manufacturers Association (Rema) will be held here April 30-May 1, at which time new officers will be elected and will take office.

Two speakers from outside the

(Concluded on Page 41, Column 3)

National Restaurant Show To Open May 7

CHICAGO — The 1951 National Restaurant Convention and Exposition will open at the Navy Pier here May 7 for a five-day run.

An estimated 25,000 operators from all parts of the country are expected to attend. They will hear a number of prominent personalities discuss current topics at general sessions in the mornings, take part in afternoon group sessions, and inspect the 731 booths of food and equipment exhibitors.

Among the companies displaying

(Concluded on Page 41, Column 3)

2 Major Air Conditioning Makers Report Increasing 'DO' Orders for Standard Items

* * *

SYRACUSE, N. Y.—Virtually every type of air conditioning and refrigeration equipment made by Carrier Corp. has been classified as essential to some aspect of the defense program and purchased under defense order ratings during the six months since the rating system went into effect, Carrier officials report.

The mounting list of defense rated contracts ranges from room air conditioners for service hospitals and experimental applications, to huge centrifugal refrigeration machines and gas compressors for defense industry and service installations.

Packaged air conditioning units of the type used for many years in stores and suites of offices, and packaged laboratory units which maintain even more precise control of temperature and humidity levels are being shipped for wind tunnel and ordnance test rooms and animal laboratories.

(Concluded on Page 2, Column 5)

* * *

YORK, Pa.—Priority-rated orders for air conditioning equipment produced by York Corp. have shown steady increases, and their diversity points up the possibilities which lie ahead for the industry in the Defense Program, states John R. Hertzler, vice president and general manager of York Corp.

Supplying air conditioning and refrigeration equipment for the air conditioning of submarines, and ammunition magazines and ship stores aboard naval vessels, has presented defense order possibilities for York, which was very active in the field during World War II. Among recent orders was equipment for 15 of the Maritime Commission's fast new type C4 cargo vessels.

However, York now looks primarily to those industries with defense priority ratings as major users of air conditioning and refrigeration equipment. The necessity for producing

(Concluded on Page 4, Column 1)

CPR 22 Will Set Mfrs. Prices After May 28

Makers of Appliances, Air Conditioning, Heating, Refrigeration Affected

WASHINGTON, D. C.—Prices of most manufacturers will be controlled starting May 28 by Ceiling Price Regulation 22 issued recently by the Office of Price Stabilization.

The regulation covers manufacturers of appliances, air conditioning and refrigeration equipment, heating and ventilating equipment, and many others.

It excludes makers of a specified list of products covered by other regulations, or which will soon be covered by other regulations. Repair and replacement parts sold by manufacturers of assembled articles for the repair of such assembled articles are also excluded from the regulation.

Ceilings will be based on the highest price prevailing during the quarter just prior to the outbreak of the Korean conflict—April 1 through June 24, 1950.

To this base, the manufacturer may make adjustments for actual increases in materials costs through 1950 and for increases in factory payroll costs through March 15, 1951.

But he will be unable to adjust for any increases in overhead and ad-

(Concluded on Page 4, Column 4)

Producers Await Word On Filing Under CMP

DETROIT—With the formal announcement having been made that a Controlled Materials Plan will go into effect July 1, manufacturers and distributors of products using the critical materials to be allocated by CMP are asking in effect "what can we do about it now?"

Actually, there's not too much that can be done until the National Production Authority issues its official "List B," essential civilian products for which allocations will be made under CMP. This it has been promised to do by early in May. In the meantime, however, it wouldn't be amiss for those producers who will probably be covered by CMP to start compiling information on their scheduling plans for the remainder of 1951.

Manufacturers of military products for the Atomic Energy Commission, and certain defense related construction projects will file their requirements under CMP. The "tentative" list of other products for which application forms will be required include refrigeration and air conditioning equipment (except household refrigerators and freezers and comfort air conditioning); motors and electrical control apparatus; heat exchangers; and heating and cooking equipment other than residential.

(Concluded on Page 41, Column 4)

Air Conditioning Installation at Purdue Aids Atomic Research

Packaged Unit Solves Serious Humidity Problem

LAFAYETTE, Ind.—How a standard packaged air conditioning unit solved a serious humidity problem on a project of vital interest to this country's defense program was described recently by Victor H. Cox of the Ed Grace Co., Inc., refrigeration contracting and engineering firm here.

Cox wrote his description as an entry in the AIR CONDITIONING & REFRIGERATION NEWS contest for the most unusual air conditioning application and won the $100 first prize in the packaged unit division.

Back in the summer of 1947, the Ed Grace Co. was called into consultation with Purdue university authorities. The company was given the problem of maintaining a low relative humidity in the special enclosure housing the physics department's cyclotron.

The machine was being used in a project for the Atomic Energy Commission. It was housed in a special enclosure in the center of a large underground room.

The walls of the enclosure were water filled steel tanks 3 ft. thick. The ceiling was composed of water filled tanks 6 ft. thick. The water dissipated neutrons generated when the machine was operated in research on the fundamental properties of nuclei and for the production of radioactive isotopes for tracer work.

During periods of high humidity, much trouble was experienced because of the high voltages in the oscillator and on the deflector. Sparkovers were frequent, rendering the cyclotron useless at those times.

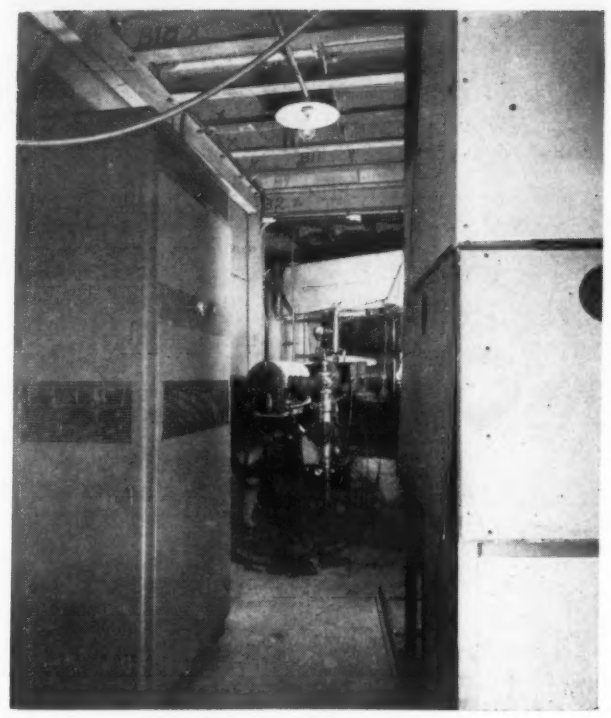
This same trouble had been experienced in World War II when the machine was used by the Manhattan District for secret projects.

Time was of prime importance and the university wanted something done about the humidity problem right away.

The air conditioning firm accepted the challenge and brought a Yorkaire 350 from its stock to the cyclotron enclosure. In 6 hours it was hooked up and operating.

The next morning, Cox recalls, sling psychrometer readings showed a 40% relative humidity. Others in mid-afternoon were not above 50%. In the outer room, at the same time, the relative humidity was 85%.

No further trouble has been experienced although the cyclotron has been in almost constant use on government projects, it was pointed out by Cox.



Defense Project

Cyclotron in Purdue university physics laboratory was not able to operate because of high humidity conditions. A Yorkaire packaged conditioner cut moisture sufficiently so that it is now possible to use the cyclotron constantly without interruption in performance.

Carrier 'DO' Orders--

(Concluded from Page 1)

In one case, a wind tunnel at an Air Force base has obtained a self-contained air conditioner to cool the room where the testing section of the tunnel is located, since the friction of air passing at high velocities through the section generates heat.

Wind tunnel, engine testing, and other research installations have also placed orders or requested quotations for centrifugal and reciprocating refrigeration equipment, cooling coils, cold diffusers, and central station air conditioning apparatus, including equipment for the Conduit Weathermaster system. The refrigeration capacity of some of these installations runs into hundreds of tons.

A centrifugal refrigeration installation completed some time ago for the Wright-Patterson Field All Weather Laboratory's environmental testing facility is chilling brine for cold weather testing to temperatures as low as -125° F. A pharmaceutical company is obtaining equipment for processing in the ultra-low temperature field, under a "DO" order, and other orders of the same type are now being negotiated.

Air conditioning of defense factories in order to produce war supplies faster, cheaper, and better is developing swiftly. One defense rated contract has been received for air conditioning a textile plant, and another large new plant in the south also will be completely air conditioned on a "DO" basis.

A number of plants for manufacturing mechanical equipment and other war products, including some which have used Carrier air conditioning in the past and are anticipating expansion for defense program purposes, are obtaining quotations on air conditioning and refrigeration equipment.

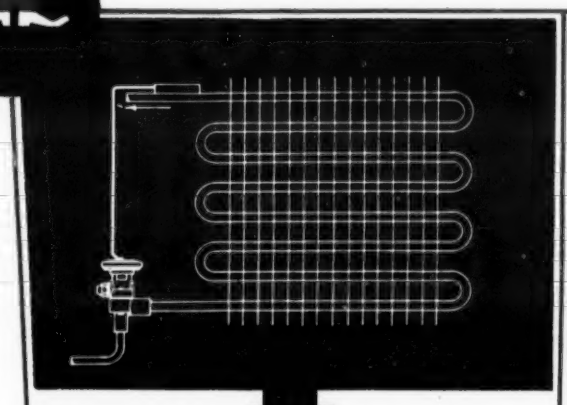
Equipment for industrial processing involved in defense production is now on order. This includes centrifugal refrigeration machines of special design and centrifugal gas compressors.

Army, Navy, and Air Force facilities are taking many items of air conditioning and refrigeration equipment. The list includes packaged year-round air conditioning units, designed originally for residences, to be used for hospital installations at a large army base. Self-contained "Weathermaker" units have been purchased for airport control towers, and for parachute drying and storage at an Air Force base in the South. A number of "Weathermakers" and matching cooling towers have been ordered by the Army for shipment overseas. The Navy is obtaining a special absorption refrigeration machine for installation in one of its ships.

Even such specialized units as the "Humidry" dehumidifier, for pulling moisture out of damp spaces, and the automatic ice cube maker have appeared on defense contracts. A number of these units have been purchased by a west coast laboratory, and automatic ice cube makers have been ordered for a service hospital and other service installations.

Control your coils more efficiently with these "twin"

ALCO THERMO VALVES



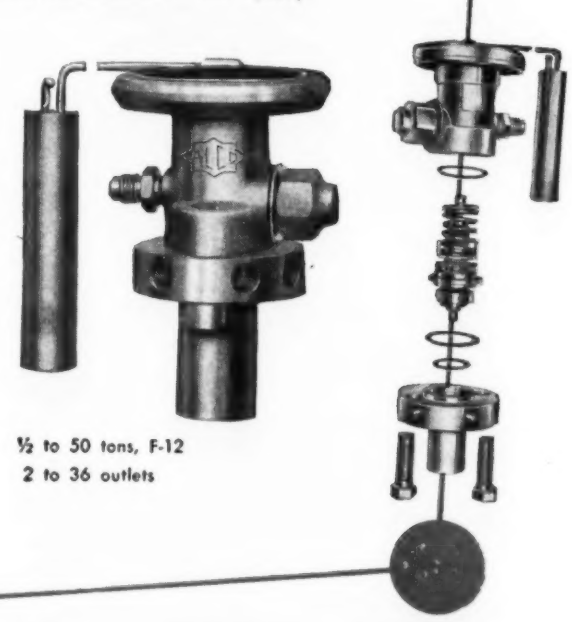
SINGLE OUTLET

SINGLE OUTLET for single path coils or independent distributing devices. Minimum moving parts for less friction. Automatic hydrogen welded for extra long life. Assures maximum efficiency obtainable with conventional type distribution.

¼ to 50 tons, F-12
½ to 100 tons, methyl chloride

MULTI-OUTLET

MULTI-OUTLET for greatest evaporator efficiency. Same simple "come-apart" construction and advanced design as Single Outlet type. Uniform distribution within the valve itself eliminates hunting, assures control, full utilization of coil capacity.



½ to 50 tons, F-12
2 to 36 outlets

25 ALCO

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Designers and Manufacturers of Thermostatic Expansion Valves; Evaporator Pressure Regulators; Solenoid Valves; Float Valves; Float Switches.

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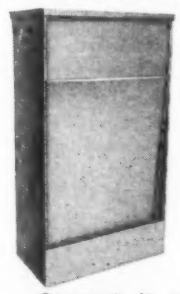

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Eliminates many production problems for your prospects. Specifically designed to control temperature of production machinery. Sizes to accommodate most machine tools.

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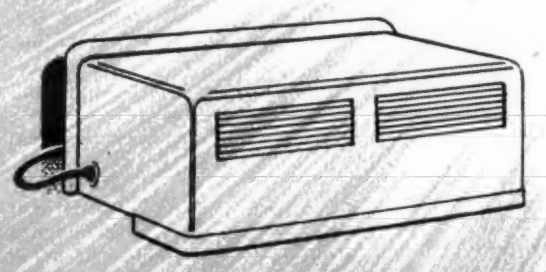
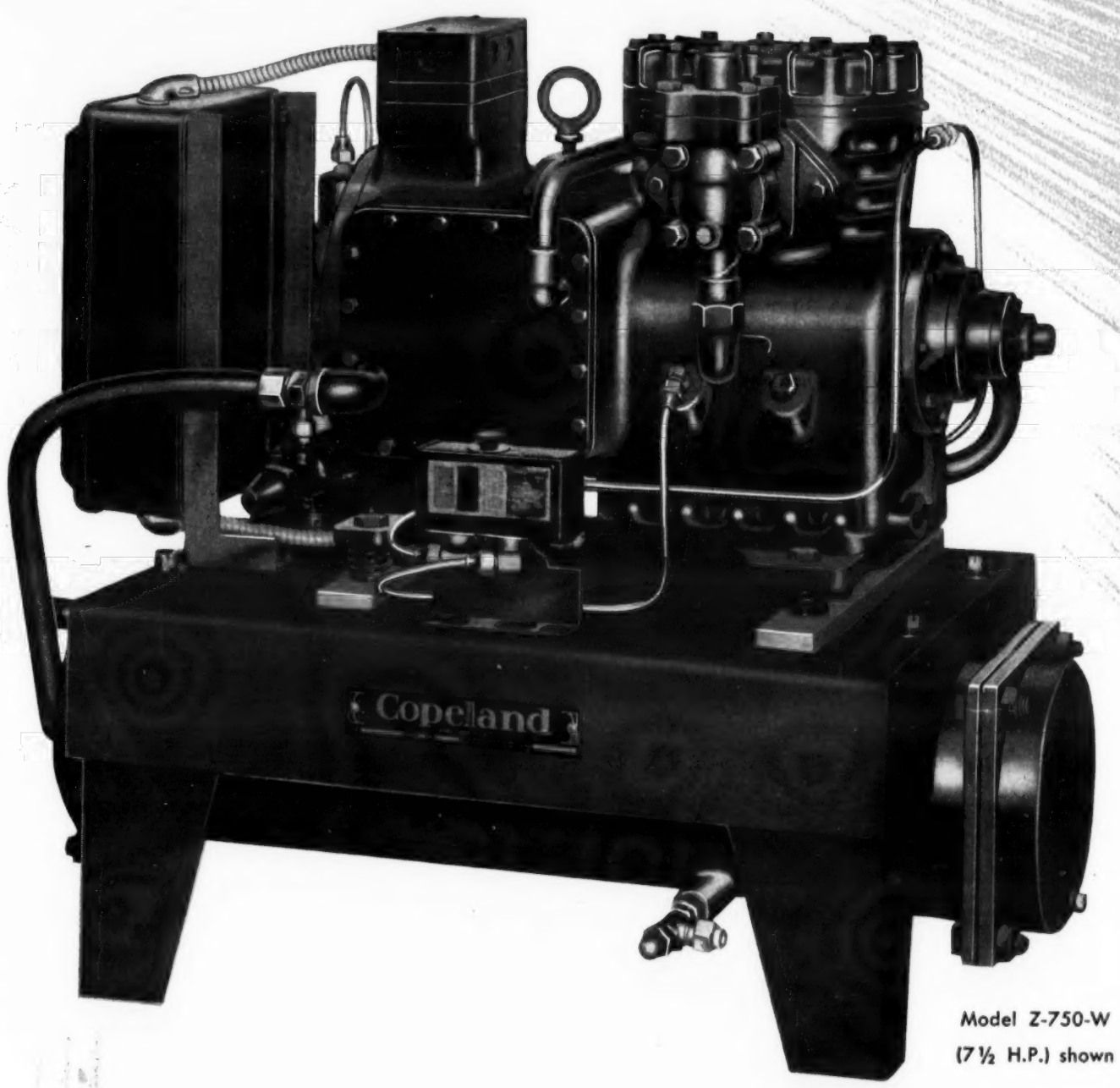
COPELAMETIC

THE *Accessible* HERMETIC





Model Z-750-W
(7½ H.P.) shown

COPELAMETIC
combines the best features of welded-in and open-type units

Because Copelametic's accessibility permits adjustments or parts replacement in the field, it's the favorite with leading producers of air-conditioning equipment, frozen food, ice cream and beverage cabinets, milk coolers and many other refrigerated fixtures.

In these times of critical materials, it's important to know Copelametic need never be returned to the factory. Forced-feed lubrication protects all bearing surfaces. Violent oil movement across the motor is eliminated and there's no refrigerant flowing through the windings. Large integral-cast fins dissipate heat rapidly.

Copelametic provides all sizes for all applications—1/6 H.P. to 7½ H.P. inclusive. Air-cooled models through 3 H.P. Water-cooled models 1/3 H.P. to 7½ H.P. inclusive.

WRITE FOR "SPEC" SHEETS

How your servicing problems are cut 90%

In Copelametic, the Accessible hermetic, Copeland engineers eliminated the three basic causes for 9 out of 10 service calls—seals, belts and manual oiling.

This was a major advance, but Copeland engineers took still another step. They investigated all possible trouble points and centered on the next major source of trouble—the valve plate.

Copeland engineers, in making the valve plate accessible, made the most practical move in refrigeration design. More than one million Copelametics are now in economical use.

COPELAND REFRIGERATION CORPORATION · SIDNEY, OHIO

York Defense Orders--

(Concluded from Page 1, Column 5)

controlled temperatures and humidities so that defense production may be accelerated cannot be overemphasized.

One jet engine manufacturer has contracted with York for a 1,200-hp. turbo water cooling system, similar to those supplied by York to General Motors Corp. during World War II. Another defense job involves a number of turbo compressor systems for the Navy's Aero Jet Laboratory site at Trenton, N. J.

All-weather chambers for both civilian and miltiary applications represent another important type of application.

Most recent all-weather chamber built for defense production is the one York constructed for Pratt and Whitney, described by *Fortune Magazine* as the largest such chamber to be found in private industry. In this chamber temperature ranges from -125° F. to 165° F. and altitudes as high as 30 miles can be reproduced.

In World War II York operated the York Naval School of Air Conditioning and Refrigeration as a section of the Navy's training program, and is now undertaking a similar venture for the Air Force. The school has been reopened under York auspices and classes are being conducted by York engineers for instructing maintenance personnel in air conditioning and refrigeration, including the latest industry developments.

York Corp.'s new business is averaging nearly $5 million a month, and weekly payrolls are approximately $278,000, Hertzler said.

Air Conditioning --Vital to America

(Concluded from Page 1, Column 4)

endlessly to improve materials and to develop new and better products.

Products of this industry, when put to use by the military, help to clothe, feed, and train men, to build the most complicated war machines, and to maintain men and machines at high efficiency.

To mention only a few military uses, there are bombsight storage and repair, parachute drying and storage, commissaries and mess halls, armament fire control, air conditioning on warships and submarines, and hospital ships.

Here are just two examples, taken at random from the many offered, of specific instances where refrigeration and air conditioning have come to be absolutely essential to important operations:

"One of this country's largest and most productive copper mines could not operate at its 4,600-ft. level until air conditioning brought the temperature down from 150° to 90° F."

"In his never ending battle for accuracy and low rejects, the metal-products manufacturer also has an indispensable ally in the air conditioned gauge room. It is there that production gauges are constantly checked against the master gauge and protected from the effects of widely-varying temperatures and humidities, assuring accurate measurements and fewer rejections of finished products.

"In precision instruments, machined to hair-breadth accuracy, air conditioning is an essential protection against the sabotage of corrosion and grit on finely-machined parts.

"And to speed airplane production, new techniques are used. Tips of spot-welding machines are refrigerated for faster aluminum welding. Aluminum rivets are cooled to sub-zero temperature, so that they can be riveted more swiftly and perfectly. Many other metal-working advances utilizing refrigeration have been developed."

Such detail on all of the applications mentioned in this article, and many more besides, are found in this industry booklet. Copies of the brochure, entitled "Refrigeration and Air Conditioning—Vital to America," are available from any of the associations.

CPR 22 To Control Mfrs. Prices--

(Concluded from Page 1, Column 5)

ministrative expenses, sales promotion, advertising, or overtime pay.

If this pre-Korean quarter was not normal for the manufacturer, he may use any of the three previous quarters as his base period—with adjustments allowed for any increases in labor or materials costs from the end of his base period to the specified cut-off dates.

Price Stabilization Director Michael DiSalle said that CPR 22 is expected to accomplish three objectives:

1. Grant relief to manufacturers who need it under the General Ceiling Price Regulation issued last January.

2. Restore more normal cost-price relationships.

3. Roll back margins that were widened after the outbreak of the Korean war.

In most instances, the order is expected to result in lower manufacturer prices. But in some cases, it may bring increases. Where increases are indicated, manufacturers must notify OPS in Washington by registered mail of the proposed increase. Then they must wait 15 days after OPS has received the notification before selling at the new figures. Notification may be given to OPS before May 28.

However, where OPS thinks the increase is unjustified, it can disapprove of the increase.

Wholesalers and retailers are expected to be able to handle any changes in the manufacturers' prices to them under provisions of OPS regulations already issued or to be issued during May.

DiSalle emphasized that this regulation is only a transitory one. It is meant to bridge the gap between the General Ceiling Price Regulation and future orders tailored to the needs of specific industries. Purpose of the order is to alleviate many of the inequities imposed by the GCPR.

OPS realizes, DiSalle indicated, that the price adjustments made in one industry will affect the costs of another industry. But, he said, it would be impractical for each producer to postpone calculations until other ceiling prices down the line were determined. To iron out such problems, more calculations of ceiling price will be made later.

Under CPR 22, manufacturers are given a single formula for computing the labor cost adjustment and four alternative methods of computing the materials cost adjustment.

These four methods are: the aggregate method, the individual commodity method, the product line method using best selling commodity, and the composite bill of materials method. The first method is said to be the simplest for most manufacturers.

To use the labor cost adjustment formula, the manufacturer determines his net sales for the last fiscal year ending in 1950 and his factory payroll for the same period. He determines what percentage of net sales his payroll was (say 30%). This is his labor cost ratio.

Then he takes his last payroll of his base period and recomputes it on the basis of the wage rates he paid on March 15, 1951, plus any increase in fringe benefits. The difference between the old payroll and the recomputed payroll, expressed in percentage, is his wage increase factor (say 10%).

Then he divides his labor cost ratio by his wage increase factor (10% of 30%, in this case) and gets his labor cost adjustment factor (3%). This 3% is added to the commodity's base period price.

To find his materials cost adjustment factor under the aggregate method, the manufacturer determines his net increase in costs and divides this by his net sales for the last fiscal year of 1950. The resulting percentage is his materials cost adjustment factor.

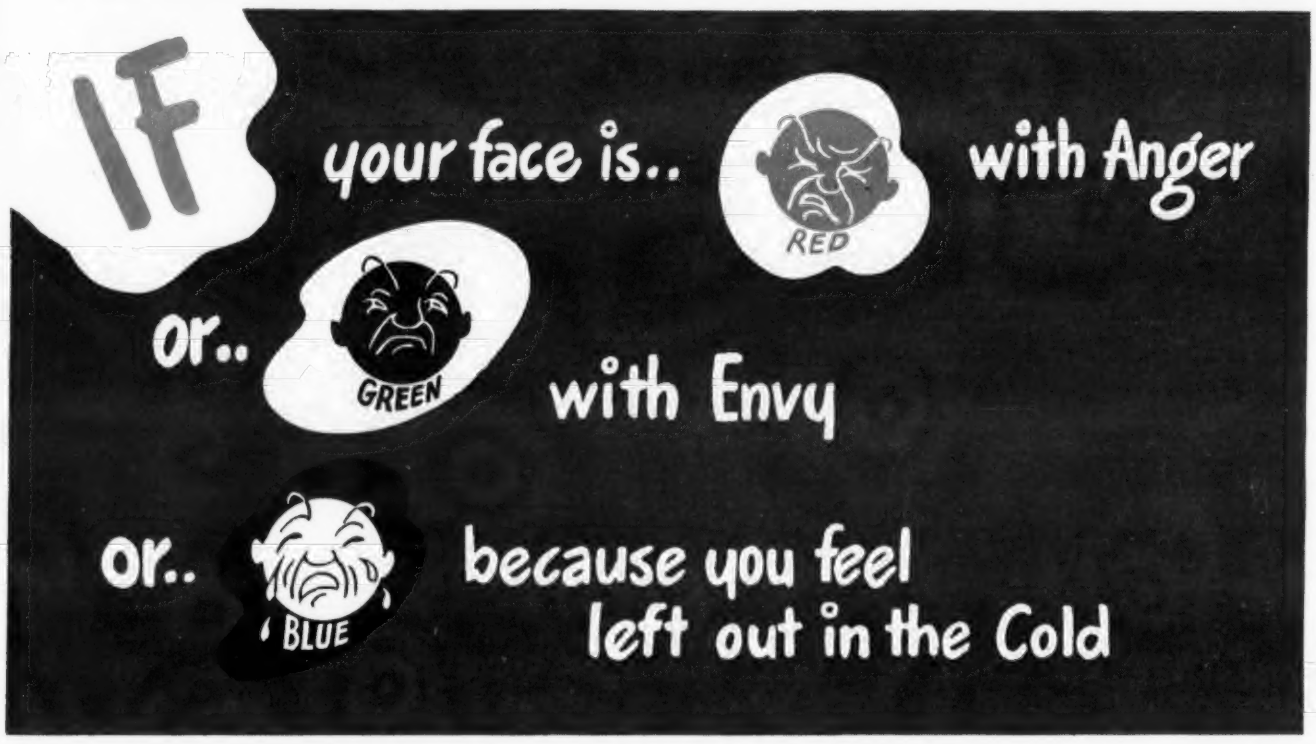
For example, net increase in costs of $50,000 divided by net sales of $1,000,000 would give a materials cost adjustment factor of 5%.

Thus, in this installation, the manufacturer with a labor cost adjustment factor of 3% and a materials cost adjustment factor of 5% could increase his highest prevailing base period price by 8%. If the price of his commodity at that time was $100, his ceiling now would be $108 for the same product.

If the manufacturer has had no increases in labor or materials costs, he may retain his base period prices without calculating adjustments.

For manufacturers who are selling products now that they did not sell prior to June 24, 1950, ceiling prices of such products will be based on computations made on comparison commodities in the same category.

OPS pointed out that sales terms under the new ceilings must be wholly consistent with base period delivery terms, differentials for purchaser classes, discounts, premiums, and other conditions.



DON'T let the Shortage of Copper Refrigeration Tubing Color your Outlook

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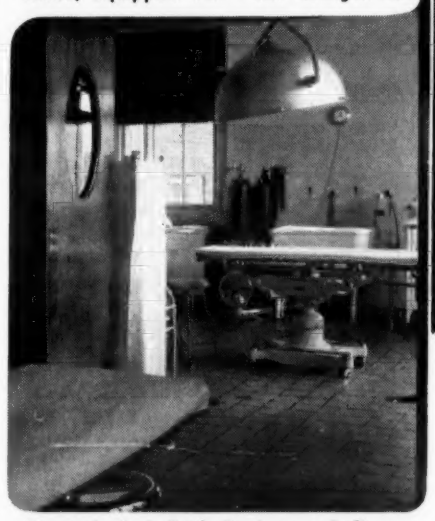
Right: The "Valley Forge," now fighting in Korea, equipped with Frick Refrigeration

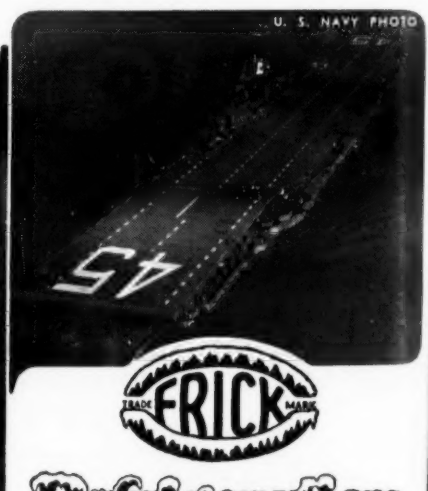


Hospitals find Frick Equipment Indispensable for Air Conditioning, Food Service, making Ice, etc.

Pratt and Whitney Achieve Accuracy within Millionths of an Inch in Room Controlled with Frick Refrigeration

Aircraft Plants use Frick Refrigeration in Large Amounts

U. S. NAVY PHOTO



FRICK Refrigeration

Serves the Nation alike in peace and war — has been doing it nearly 70 years.

Thousands of Frick machines were furnished the Army, Navy, Air Force and Marines in World War II.

Whether the need is for air conditioning, ice-making, food freezing, or any other cooling work, there's a Frick system of size and type to do the job dependably.

DEPENDABLE REFRIGERATION SINCE 1881
FRICK CO.
WAYNESBORO, PENNA. U.S.A.

He doesn't worry about the weather...

...his room conditioner is dependable because it is equipped with a TECUMSEH HERMETIC

Send for complete specifications on these 1/3, 1/2 and 3/4 H.P. air conditioning compressors today.

Mark Twain said: *"Everybody talks about the weather, but nobody does anything about it."*

Today people are doing something about the weather—they are air conditioning their offices and homes for better working and living comfort . . . and if you are one of the manufacturers of these room conditioners, it will more than pay you to investigate Tecumseh's line of hermetics.

Built upon the idea that the refrigeration industry needed a smoother, quieter, more dependable unit, Tecumseh engineers have developed the Tecumseh Single and Twin Cylinder Hermetic Units and Compressors. Free from vibration because they are internally cushioned, these Tecumseh Hermetics bring to the air conditioning industry low-cost, high-capacity condensing units that develop peak performance with minimum size.

If you need a heavy duty compressor that will stand heavy loads under tough conditions, you can rely upon the complete year-in and year-out dependability of Tecumseh.

TECUMSEH CHIEFTAIN

TECUMSEH PRODUCTS COMPANY
TECUMSEH, MICHIGAN
UNIVERSAL COOLER DIVISION: MARION, OHIO
EXPORT DEPARTMENT: 2111 WOODWARD AVE., DETROIT 1, MICH.

★ The world's largest producer of compressors and condensing units for the refrigeration industry. ★

A Very Real Need

Trane Co.'s Backlog of Orders Reflects Wide Range of Air Conditioning Use

LA CROSSE, Wis.—Today's order backlogs, by their very nature, indicate growing acceptance of the essentiality of the air conditioning, heating, and ventilating industries, according to D. C. Minard, executive vice president of The Trane Co. here.

Despite the large backlog of authorized but uncompleted commercial, residential, industrial, and apartment constructions, defense business represents a substantial share of the new orders for the air conditioning industry, Minard said. More than one fifth of The Trane Co.'s backlog in its standard air conditioning, heating, and ventilating lines consists of defense orders, he stated.

In the present emergency, as in World War II, such products as convectors, unit heaters, fans, unit ventilators, air conditioners, and refrigeration units are being ordered in substantial volume for comfort applications in defense plants, military installations, barracks, radar and weather stations, and ships. An increasing number of delicate manufacturing processes, particularly in the electronic and optical fields, require complete cleanliness and precision control of temperature and humidity, it was pointed out.

Evaporative coolers, centrifugal and reciprocating refrigeration units, cooling coils, and other standard air conditioning products are being used in increasing volume in both metal-working and chemical processing industries.

The air conditioning industry's experience in heat transfer, air handling, and refrigeration is reflected in an increasing volume of special orders. Trane, for example, has received very substantial orders for its brazed aluminum heat exchangers for military aircraft, and for process equipment in production of oxygen, rare gases, and plastics as well as chemicals.

Both the Aluminum Co. of America and Kaiser Aluminum have placed large orders for fluid coolers for the huge diesel installations that power aluminum reduction plants included in the aluminum industry's defense expansion.

Special Trane evaporative coolers are key components of several Voice of America stations, and Trane fluid coolers have been shipped overseas for important Navy radio installations.

Maas Bros. Is Mitchell Dealer

CHICAGO—The Mitchell Mfg. Co. here and the St. Anthony Corp. of Clearwater, Fla., announced the appointment of the Maas Brothers Department Stores of Tampa, St. Petersburg, and Ybor City as dealers for Mitchell's window-type room air conditioners.

Scrap Loss Cut In Half When Cast Iron Foundry Dehumidifies Blast Air for Cupola

ANDERSON, Ind.—Scrap loss was reduced sharply in the Delco Remy cast iron foundry here by the installation of an 80-ton Frigidaire air conditioning system to dehumidify the blast air fed to the cupola. This is believed to be one of the first installations of its kind.

The automatic system removes as much as 9 lbs. of water per minute from the 6,500 cu. ft. of air per minute which is fed to the cupola, reports Glen Rogers of Rogers Electric Co., the Anderson firm which made the installation.

His description of this installation won the $100 first prize for central systems in the recent air conditioning contest sponsored by AIR CONDITIONING & REFRIGERATION NEWS.

"A study of scrap in this foundry during 1949 showed that the scrap loss closely followed the amount of humidity in the atmosphere. During the summer of 1949, for instance, the scrap loss averaged around 15%, and at the same time the humidity reached as high as 10 grains per cu. ft. of air—a relative humidity of 80% at 85° F.," explains Rogers.

"This was to be expected since the central Indiana climate is noted for its high humidity during the summer.

"It was finally determined that scrap loss could be maintained at a satisfactory minimum if air with not over 3 gr. of moisture per cu. ft. could be supplied. After checking air dehumidifying devices, an air conditioning installation was decided upon as being the most satisfactory,

Checking wet bulb recording thermostat at Delco Remy cast iron foundry to make sure moisture does not rise above 3 gr. per cu. ft. This ratio has cut scrap loss from 15% to 7% since dehumidifying equipment was installed.

both from the standpoint of first cost, as well as maintenance and ease of control. Figures for June, July, and August, 1950, with the dehumidifier in operation show a startling improvement over the same period in 1949," Rogers says. "Scrap loss dropped to an average of around 7% as compared with 15% in 1949. During this period, the atmospheric humidity was practically the same as for the same months in 1949."

These sharply reduced scrap losses will soon pay for the installation.

The huge system cools the blast air fed to the cupola to a constant temperature of 40° F.

"This temperature was chosen because air at a temperature of 40° F. cannot hold more than 3 gr. of moisture per cu. ft., which is not enough to affect the casting adversely," Rogers explains.

Four-step Frigidaire compressors, each of 20-ton capacity, are located in a special machinery room supplied with filtered air. Filtering keeps the air clean to protect the motors.

The compressors are controlled by a Bristol wet-bulb recording thermostat operating a 16-step Barber-Coleman controller. The control hookup varies the capacity of compressors and coils over a range of from 5% to full capacity.

The control panel, incidentally, includes 16 pilot lights, one for each step of the controller, so the engineer can readily see at what per cent of capacity the system is operating.

Heat transfer equipment consists of eight Frigidaire Multipath coils, each of which is equipped with two Frigidaire expansion valves. These are mounted in a built-up housing which also contains an automatic oil-washed filter bank and a moisture eliminator.

The 6,500 c.f.m. of air supplied to the cupola first goes through the filters, then the coils, and finally the moisture eliminator where moisture falls to the floor and is drained out before it is fed into the duct leading to the cupola. Entire air movement is accomplished by the cupola blower.

We'll 'Paul Revere' This Issue!

One thousand extra copies of this important and informative issue of AIR CONDITIONING & REFRIGERATION NEWS are being placed on the desks of key government officials in Washington, D. C.

Why? Because we feel that it is important for them—and for people in the industry, too—to know what essential tasks air conditioning has done and will do for national defense—if given the opportunity.

All Congressmen, both senators and representatives, are receiving copies. So are executives in the various departments and agencies who possess the authority to make or influence government decisions affecting this industry. Military procurement offices throughout the country are also being sent copies for their information.

On the Washington, D. C. list are top officials in the Department of Defense, Department of Commerce (particularly administrators and directors of various divisions of NPA), Department of the Interior, Department of Agriculture, Department of Labor, Office of Defense Mobilization, National Securities Resources Board, Economic Stabilization Agency (both wage and price divisions), Civil Defense Administration, Defense Transport Administration, Atomic Energy Commission, Economic Cooperation Administration, General Services Administration, and the Federal Supply Service.

Larkin HYDRO-MISER Cooling Tower Now in Mass Production

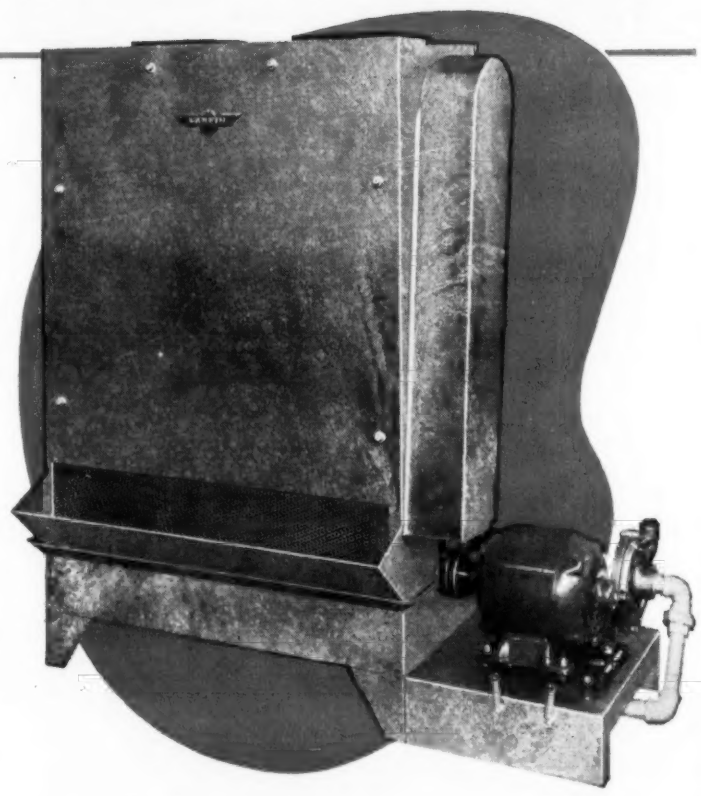
BUY NOW AND AVOID SEASONAL RUSH

Immediate Shipment

AN ENTIRE PLANT is now devoted exclusively to the manufacture of the LARKIN Hydro-Miser Cooling Tower as a result of nation-wide acceptance of this relatively new LARKIN product.

Already used in hundreds of installations where water-saving is essential, the LARKIN Hydro-Miser Cooling Tower has proved its worth.

Designed to save up to 95% on water used with air conditioning and commercial refrigeration units, the LARKIN Hydro-Miser Cooling Tower soon pays for itself.



Answer to Serviceman's Prayers

LARKIN engineers perfected the Hydro-Miser by keeping the serviceman in mind. Here's what we mean. . . .

One-piece grill, splash guard and panel on 3, 5, and 7½-ton models • No screws or bolts on panels—Larkin latches have replaced them • Flange-type, self-aligning graphited bronze bearings on outside (exterior oil cup provided where center bearings are required) • Easy, simplified installation — minimum piping • Double ball bearing pumps and single-drive heavy-duty motors • Eliminator section slides out for easy cleaning • Wetted surface assembly also easily removable • Large orifice-type bronze spray nozzles easily removed for cleaning.

Hot-Dip Galvanized After Fabrication

LARKIN'S Hydro-Miser Cooling Tower is protected inside and out by hot-dip galvanizing after fabrication—including fans, scrolls, panels and frames. Positive protection against rust. To give extra protection, acid-resistant mastic paint is applied to entire inside of unit after galvanizing.

This all adds up to an all-round quality in keeping with LARKIN COIL'S record for high-quality products at reasonable prices.

A full range of models is now available for immediate shipment. Order now from your wholesaler and avoid the seasonal rush just ahead.

LARKIN COILS INC.
519 MEMORIAL DRIVE, S.E.
ATLANTA, GEORGIA
THE WATCHDOG OF THE NATION'S FOOD SUPPLY
ORIGINATORS OF THE CROSS-FIN COIL

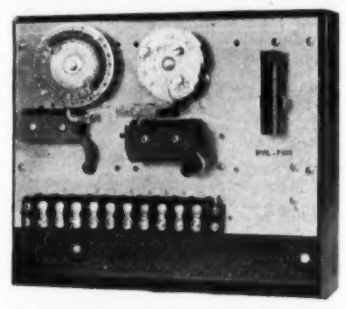
T. O. McDAVID C. J. ZINK

Commercial Credit Names 2 New Vice Presidents

BALTIMORE — Thomas O. McDavid and Carl J. Zink have been elected vice presidents of Commercial Credit Corp., the company announced.

They will be responsible for further developing the company's national activities in the industrial field comprising home appliances, television and radio sets, air conditioning, and commercial equipment, according to E. C. Wareheim, president of Commercial Credit Co.

PARAGON DEFROSTING TIME SWITCHES



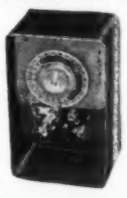
CHRONO-SPRAY *Defrosting Control*
For Water-Spray Defrosting
IT'S FAIL-SAFE!

- A completely flexible defrosting control for Locker Plants, Breweries, Dairies, Walk-In Boxes, Unit Coolers, Air Conditioning.
- A synchronous motored combination 24-hour Time Switch and 60-minute Timer especially designed for water-spray defrosting.
- Provides from 1 to 24 defrost periods per day. Also controls defrost duration in three separate adjustable periods: delay; water-spray; drain.
- "Fail-safe" feature prevents possibility of evaporator fans running while unit is being defrosted. Complete flexibility with utmost simplicity.

***Paragon* 300 Series**
For All Types of Commercial Defrosting:

- COMPRESSOR SHUT-DOWN
- ELECTRIC-HEATER DEFROSTING
- HOT GAS OR REVERSE CYCLE

An accurate, durable, precision-built time switch for all types of commercial defrosting applications where defrost is two hours or less. Easy-to-set pin-type dial. Heavy hasped case; unbreakable door glass. Also made in heavy-duty outdoor type, Series 330.



for
UNIT COOLERS • WALK-IN-BOXES
FROZEN-FOOD DISPLAY CABINETS
LOCKER PLANTS • REACH-IN BOXES
FUR-STORAGE VAULTS

Made by America's Largest Exclusive Manufacturer of Time-Controls for All Uses.

MAKERS OF THE FAMOUS **de-frost-it**
FOR DOMESTIC REFRIGERATORS - - ONLY $9.95
***Paragon* ELECTRIC COMPANY**
1687 TWELFTH STREET • TWO RIVERS, WIS.

You can tell the difference . . . blindfolded!

THAT IS NO EXAGGERATION. Nothing in a refrigerator more clearly shows quality . . . or the lack of it . . . than the construction of the freezer chest. And particularly, the across-the-top type . . . the type that women have come to regard as being practically a small home freezer!

Kelvinator introduced the *first* across-the-top freezer chest . . . in 1936 . . . and Kelvinator has pioneered in engineering larger capacity, greater efficiency into this type chest. Kelvinator is proud of these achievements . . . takes pride in building into its freezer chests quality features that are found in *no other brand.*

The result: even a *blindfolded* customer could tell the difference in quality between Kelvinator and other refrigerators!

FIRST, she could tell that there are freezing coils in all four walls . . . and that the *back* is refrigerated, too . . . *5 refrigerated surfaces* in all . . . to provide surer, lower temperatures . . . safer cold.

SECOND, she could tell that Kelvinator puts a back on its across-the-top chest to keep in the cold, keep out warmth and moisture.

THIRD, she could tell that Kelvinator uses a gasket around the front edge of the chest against which the door closes . . . as a further seal.

FOURTH, she could tell that the aluminum Kelvinator uses in this chest has a special reinforcing design . . . it's not only rustproof . . . but extra strong, durable and resistant to scratches.

FIFTH, she could tell that Kelvinator encloses the chest with a double-panelled door and its solid "feel" tells her that it's packed with insulation . . . so the front won't sweat and drip water.

SIXTH, she could even tell from the thick, solid "feel" of the baffle that it's *built right* . . . it's insulated, too, to prevent sweating and dripping onto the foods below.

The important point to retailers and to their customers is this: *all* of these quality features are built into every Kelvinator *across-the-top freezer chest model . . . regardless of price!*

Yes, there's a *big difference* in Kelvinator quality which you can even tell blindfolded—and in that difference Kelvinator retailers have yet another big reason why the Kelvinator franchise is the most valuable in the appliance industry!

GET MORE Get Kelvinator

TUNE IN! CBS-TV NETWORK! Kelvinator *"Star of the Family"* show, starring Morton Downey. See your local paper for time and station.

THE MOST VALUABLE FRANCHISE IN THE APPLIANCE INDUSTRY

ELECTRIC REFRIGERATORS . . . RANGES . . . FREEZERS . . . WATER HEATERS . . . AIR DRIERS

KELVINATOR • DIVISION OF NASH-KELVINATOR CORPORATION • DETROIT 32, MICHIGAN

INSIDE DOPE

by GEORGE F. TAUBENECK

(Concluded from Page 1, Column 1)

—which is America's policy as of this moment—may buy us the time we need to become so strong that the Big War can be staved off indefinitely.

In this connection, "off-the-record" remarks revealed that we are farther along in our preparedness program than is commonly realized. By December of this year, perhaps, our output of weapons may hit the peak originally budgeted for July, 1952. And our stockpiling program is in better condition than has been admitted publicly.

In short, if Russia strikes *this year,* we'll be in far better shape than we were in 1942, although we won't be "ready." Next year, however, we'll be in the saddle, and can bet the strength of a pat hand in global show-downs.

Such optimism isn't being broadcast, because official Washington feels that "the people" need to be stirred up, rather than calmed down.

(Let us repeat: These statements are "Dope's" evaluation of unquotable "informed opinion." Both the opinion and the evaluation could be wrong.)

Raw Materials and Prices

Assuming that this "informed opinion" is on the beam, 'tis possible that controls on business and industry may not be so stringent nor so prolonged as has been imagined and projected.

Steel expansion, for example, is coming along famously. Copper imports can be stepped up by paying higher prices. Aluminum producers have been slow to enlarge capacities, but this situation is being rectified. New sources of cobalt, uranium, oil, and titanium are coming into production.

In the meantime the Controlled Materials Plan (CMP) which purports to allocate steel, copper, and aluminum may not really bite hard until the snow flies. In the fourth quarter, however, small producers may be scrambling for materials.

Bureaucratic Troubles

Does all this "informed opinion" mean that manufacturers of air conditioning equipment (relatively small businessmen) will be able to keep their heads above water in the next 12 months? On the contrary. Some may have to close up shop.

True, sops to "little business" are contemplated, such as:

(1) Special concessions to prime contractors who subcontract a substantial portion of their work.

(2) Negotiated bidding—which will give small "camels" a chance to poke their heads into the tent.

(3) Exemption of freight differentials in comparative bids.

Whether or not these "throw the dogs a bone" gestures will take effect quickly enough remains to be seen.

A sad fact remains, viz., *air conditioning is considered as a luxury* by too many uninformed men in government circles.

Nothing could be farther from the truth. As the Carrier Corp. has pointed out:

"In World War II—and in the breathing spell that followed—air conditioning proved itself as a production tool. In airplane engine factories, air conditioning prevented the expansion and contraction of metals—helped make finely tooled parts fit exactly. In electronics plants, air conditioning assured the microscopic precision required for guided missiles, radar, and bombsights. In drafting rooms, air conditioning increased output—reduced the number of damaged drawings.

"The air conditioning of whole plants stepped up production, in both quantity and quality. Men and machines became more efficient.

"Today in America fast assembly lines are being brought into operation. And at critical points along these lines, air conditioning will help turn out goods faster, better, cheaper.

"America is getting ready to cope with whatever may come. Factories all over the land are turning from peacetime production to defense production. And even the most sanguine hopes of avoiding total war are tinged with the urgent need for preparation."

Need for Small Plants

American industry is something more than great big companies. Thousands of small factories must produce the parts which will feed the final assembly lines. Many of these will need air conditioning—and quickly—to insure uniformity of output. The answer to this problem is "packaged" air conditioners. They can be obtained on short notice. Their installation is a simple job. Frequently, ductwork is not needed. These units may be installed singly or in groups. Primary work of these units is not the comfort of the workmen. Rather, it is the close control of tolerances in machinery.

"The job air conditioning and refrigeration can do was made crystal-clear during World War II" (again quoting Carrier). "In plants everywhere, it was a production tool—helping make things faster, better, cheaper.

"By providing constant temperature and humidity, it kept hundreds of precise parts corrosion-free and to close tolerance—speeding the mass production of aircraft engines. By cooling brine to 85° below zero it helped turn out an ever-increasing volume of synthetic rubber. It preserved food for safe transportation throughout the world. It was vital in the production of radar and optical equipment, electronic devices, synthetic fibers, high-octane gasoline, sulfa, penicillin, and scores of other key products.

"What about air conditioning the space in which delicate gauges are to be stored? Is this more important than making bearable the hot and humid room where men are working around the clock on defense planning? These problems must be resolved by answering this basic question—will air conditioning get the job done faster, better, cheaper?"

A mighty fine statement of a mighty fine case.

Snafued Seal

Whom would *you* call if you wanted a dead seal removed from your premises? Officials of the Portuguese Bend Beach club, San Pedro, Calif., were faced with that problem when a flagrantly fragant deceased seal washed up on a nearby beach.

The Coast Guard was called pronto to haul it away. But the Coast Guard said, "Sorry, a little out of our line. Better call the sheriff."

The sheriff suggested the county lifeguards, who passed the buck to California's Humane Society. No dice, sniffed the Humane Society. "Try the State Department of Streets and Roads."

"Not for us," spurned the Road Department. "This is a job for the Air Pollution Board." And maybe, by this time, it was.

But they didn't want the job either, and so the Department of Parks and Recreation was summoned. Promptly this bureaucracy shunted the problem to the Health Department which, in turn, shifted it to the Department of Sanitation.

Trying to be helpful, the Sanitation crew recommended that bewildered club officials call the Coast Guard, completing the circle of musical chairs.

Exasperatedly, the clubmen rented a truck, tied handkerchiefs over their noses, and hauled The Thing away.

Ten Mistakes of Life

"To set up your own standard of right and wrong and expect everybody to conform to it.

"To try to measure the enjoyment of others by our own.

"To expect uniformity of opinion in this world.

"To look for judgment and experience in youth.

"To endeavor to mold all dispositions alike.

"Not to yield to unimportant trifles.

"To look for perfection in our own actions.

"To worry ourselves and others about what cannot be remedied.

"To believe only what our finite minds can grasp.

"To live as if the moment, the time, the day were so important that it would live forever."—*United Evangelical Visitor.*

Good News

The nation's electrical industries are expanding for defense production "in a way and on a scale that Russia apparently does not comprehend, probably will not believe, and certainly cannot match," declares Tomlinson Fort, vice president of the Westinghouse Electric Corp.

The electric power industry already has expanded 40% since V-J Day, and will expand 35% more in the next three years to meet both military and civilian needs, he confides.

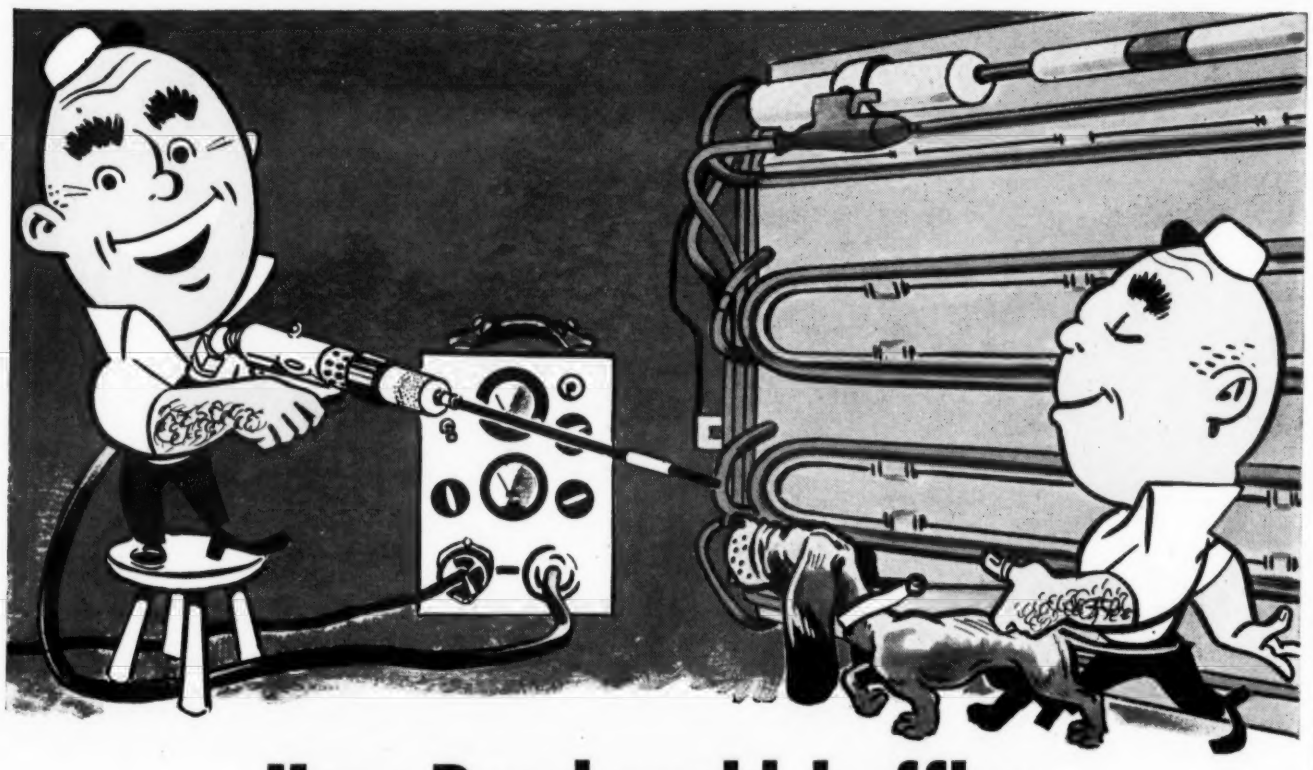
"The growth of the electric power industry will go on at an average rate of something like 6% per year for the next 15 years, and the electrical manufacturing industries will keep pace with the growth. The immediate purpose of our industry is to expand for defense production," notes Fort.

The Federal Reserve Board index of industrial production predicts a rise from the figure of 198 for the year 1950 to approximately 250 by 1953, an increase of 26%. This increased production, plus larger power requirements for homes, farms, and commercial establishments, will increase power sales during the same three-year period by 31%.

In 1950, the utilities bought 14 million kilowatts of additional generating capacity, and they had another 14 million kilowatts of capacity on order at the beginning of 1951. Nearly all of this 28 million kilowatts will be installed by the end of 1953, thus bringing installed capacity to 93 million kilowatts or more.

Much of the demand for defense production power will be put to the same uses as in World War II. There will be less shipbuilding; but new power demands for the atomic energy program, the production of aluminum, wind tunnels for testing aircraft, and air conditioning will close the gap.

N.B.: Air conditioning is recognized as a useful tool for defense production by the men who manufacture weapons.



How Bundyweld baffles the "world's best nose for leaks"

Wherever tubing has a role in refrigeration, there's a place for Bundyweld!

Its amazing leakproof qualities alone set this unique tubing far above tubing of any other type.

The halogen vapor leak detector, "world's best nose for leaks," accurately sniffs out leaks as infinitesimal as 1/100 of an ounce *a year!* Yet under continued tests, no evidence of leakage was found with Bundyweld during various test periods.

Why this phenomenal performance? Because Bundyweld is double-walled from a single strip and copper-brazed through 360° of wall contact. This exclusive Bundy process also means a stronger, lighter tubing that's thinner walled for *faster cooling*. Bundyweld is ductile, too! It can be bent, fabricated with ease, to meet the most demanding forms without collapsing or weakening structurally.

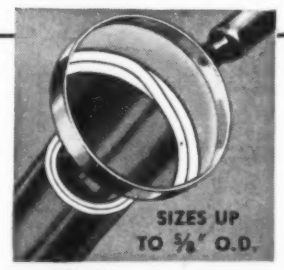
Your refrigeration tubing requirements will find a made-to-order answer in Bundyweld. Get the complete facts from a Bundy distributor listed below, or write: ***Bundy Tubing Company, Detroit 14, Michigan.***

Bundyweld® Tubing

DOUBLE-WALLED FROM A SINGLE STRIP

WHY BUNDYWELD IS BETTER TUBING

Bundyweld starts as a single strip of basic metal, coated with a bonding metal. Then it's . . . continuously rolled twice around laterally into a tube of uniform thickness, and passed through a furnace. Bonding metal fuses with basic metal, presto— Bundyweld . . . double-walled and brazed through 360° of wall contact.



NOTE the exclusive patented Bundyweld beveled edge, which affords a smoother joint, absence of bead and less chance for any leakage.

Bundy Tubing Distributors and Representatives: *Cambridge 42, Mass.:* Austin-Hastings Co., Inc., 226 Binney St. • *Chattanooga 2, Tenn.:* Peirson-Deakins Co., 823-824 Chattanooga Bank Bldg. • *Chicago 32, Ill.:* Lapham-Hickey Co., 3333 W. 47th Place • *Elizabeth, New Jersey:* A. B. Murray Co., Inc., Post Office Box 476 • *Philadelphia 3, Penn.:* Rutan & Co., 1717 Sansom St. • *San Francisco 10, Calif.:* Pacific Metals Co., Ltd., 3100 19th St. • *Seattle 4, Wash.:* Eagle Metals Co., 4755 First Ave. South *Toronto 5, Ontario, Canada:* Alloy Metal Sales, Ltd., 881 Bay St. • Bundyweld nickel and Monel tubing is sold by distributors of nickel and nickel alloys in principal cities.

United

FOR Quality AND Economy

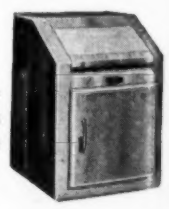
DRY KOOL BOTTLE COOLER

World famous for performance and design. 14 models to meet all requirements in stainless steel or brown Dulux finish.

UPRIGHT FREEZER
15 Cubic Feet

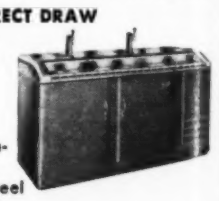
Scientific placement of cooling coils, two separate food compartments, dual doors to minimize cold loss, insure balanced freezing at minimum cost.

KUBEMASTER ICE CUBE MAKER



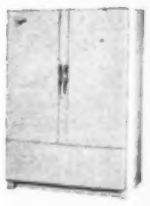
Whenever food or refreshment is served, ice cubes as you need them. Choice of 3 beautiful models.

KOOLMASTER DIRECT DRAW



Engineered to serve beer to the "Brewmaster's" taste. Its smart appearance enhances any establishment. Choice of 8 models in Stainless steel or brown Dulux finish.

REACH-INS



Modern flush fronts with recessed handles in popular sizes. Ten models to choose from. Available in white Dulux, stainless steel fronts and glass doors.

DESIGNED—ENGINEERED—MANUFACTURED By

UNITED REFRIGERATOR COMPANY

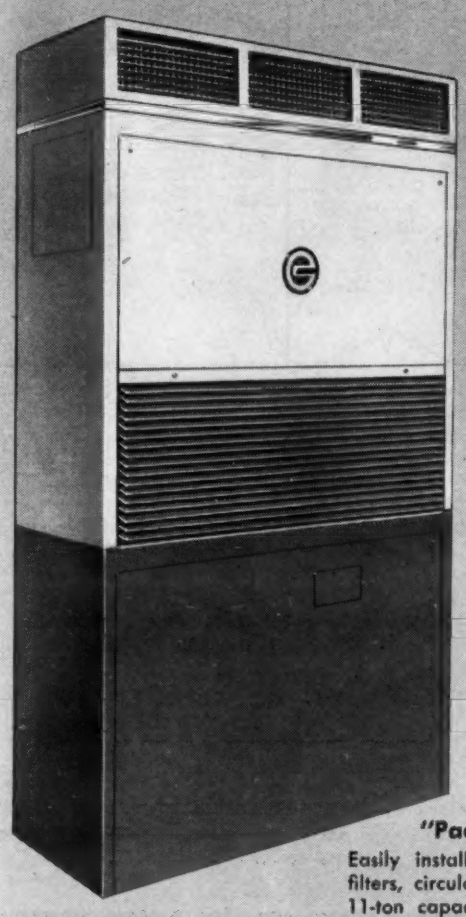
Locust and Walnut Sts.
HUDSON, WISCONSIN

Chrysler Airtemp

A VITAL FORCE IN NATIONAL DEFENSE

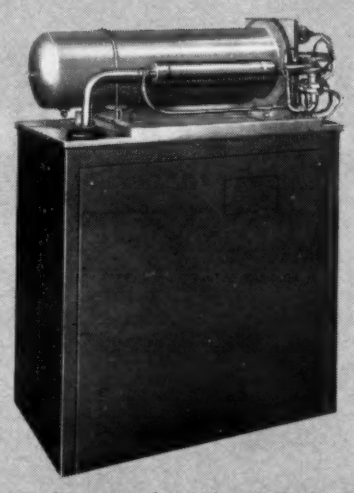
CHRYSLER AIRTEMP
DIVISION OF CHRYSLER CORPORATION

A VITAL FORCE IN NATIONAL DEFENSE



"Packaged" Air Conditioner
Easily installed. Cools, ventilates, dehumidifies, filters, circulates. Five models—2-, 3-, 5-, 8- and 11-ton capacities—to meet every cooling need.

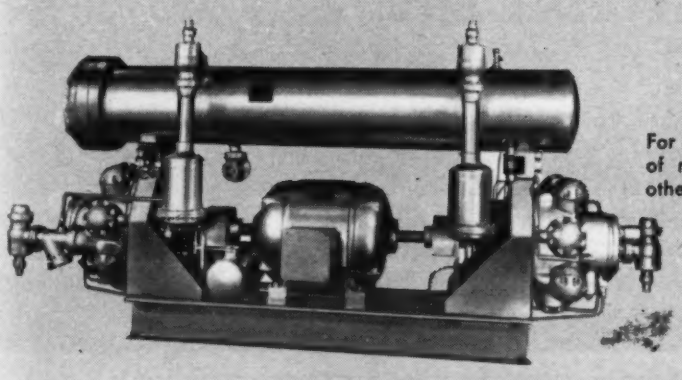
Dehumidifiers
Extremely portable, can be plugged into any electrical outlet. Ideal for map rooms, laboratories or rooms where moisture is a problem.



Machine Tool Coolant Cooler
Keeps coolants in automatic machine tools at a constant temperature. Helps provide greater precision and higher production. Reduces friction heat.

During World War II, Chrysler Airtemp won recognition as an outstanding factor in the national defense effort. By waging war against the enemies of production, precision and perishables: uncontrolled dust, humidity and temperatures—Chrysler Airtemp made a major contribution toward speeding the armament program. On all fronts—at home and abroad—in assignments that covered every conceivable application of temperature and humidity control, Chrysler Airtemp served with distinction. Chrysler Airtemp is serving again in building the sinews of defense. A complete range of products and equipment—from small, portable dehumidifiers to large capacity central station units—enables Chrysler Airtemp to provide the quickest, most effective answer to any production problem—civilian or military—which involves the control of indoor atmospheric conditions.

Commercial Refrigeration Unit
Designed especially for cold rooms, walk-in boxes and other cold storage applications. Ideal for installations for food preservation and refrigeration.



Central Station Unit
For large installations, this unit forms the heart of many air conditioning, cold storage and other temperature and humidity control systems.

Room Air Conditioner
Fits right in window, cools, filters and circulates fresh outside air, expels stale room air. Ideal for offices, hospital convalescent rooms, workshops or other small areas.

Chrysler Airtemp

AIR CONDITIONING • HEATING • COMMERCIAL REFRIGERATION
AIRTEMP DIVISION OF CHRYSLER CORPORATION
DAYTON 1, OHIO

A Matter of Health

Bill Introduced To Regulate Air Conditions In South Carolina Textile Plants

COLUMBIA, S. C. — Three senators—Arrants of Kershaw, Gasque of Marion, and Leppard of Chesterfield—have introduced a bill to regulate ventilation, temperature, and humidity in textile plants in South Carolina.

The new measure, similar to one introduced in the House last year, would create an industrial health board of three members appointed by the governor, plus the state health officer and the commissioner of labor.

According to the sponsors, the board would be authorized "to order changes" in the ventilation and conditions of temperature and humidity of air in any textile mill employing 10 or more persons, after giving notice and after a public hearing.

Senator Arrants said four factors would be considered in issuing any order:

The health, comfort, and safety of employes by maintaining dirt-and-impurity-free air, and by providing sufficient air changes to prevent excessive temperatures and humidity.

The manufacturing process in the plant or section of the plant, so as not to cause a handicap of production, to the detriment of employer and employes.

The financial condition of the plant and the general economic conditions prevailing so the order would not be prohibitive or cause undue hardship.

Efforts of the plant to provide healthful conditions on its own initiative (and recent installations of ventilation equipment would not be declared inadequate except in extreme cases).

Under the terms of the proposed measure, the state labor commissioner, with the help of the health officer, would inspect and report to the board on needed changes, and any citizen or group would have the right to petition for an investigation and order.

A set of instruments would be required in each plant under rules and regulations devised by the board. Each violation of an order of the board, which may be appealed to the courts, would constitute a violation, for which the penalty would be a $500 fine or imprisonment for not more than 60 days, or both.

The bill last year was introduced by 11 House members, all of whom were from textile counties. The year before, a somewhat stronger measure was tabled by a narrow margin in the House.

Air Conditioned Motel Opens

JACKSONVILLE, Fla.—Completely air conditioned, the new 62-suite Ace Motel has opened at 4832 Main St., with Jack Murray as manager. Murray says present plans call for the completion of 123 suites.

Packaged Cooling for Veterans Hospital

Because Anesthetics Are Highly Explosive, Air Conditioning Is a Problem; Okla. Veterans Hospital Solves It with 5-Ton Unit

SULPHUR, Okla. — Exacting requirements for air conditioning the operating rooms at the Veterans hospital here were met by the installation of a standard 5-ton ASL-500 Frigidaire packaged air conditioner, according to G. E. Trahern of the G. E. Trahern Co., Pauls Valley, Okla., successful bidder and installer of the job.

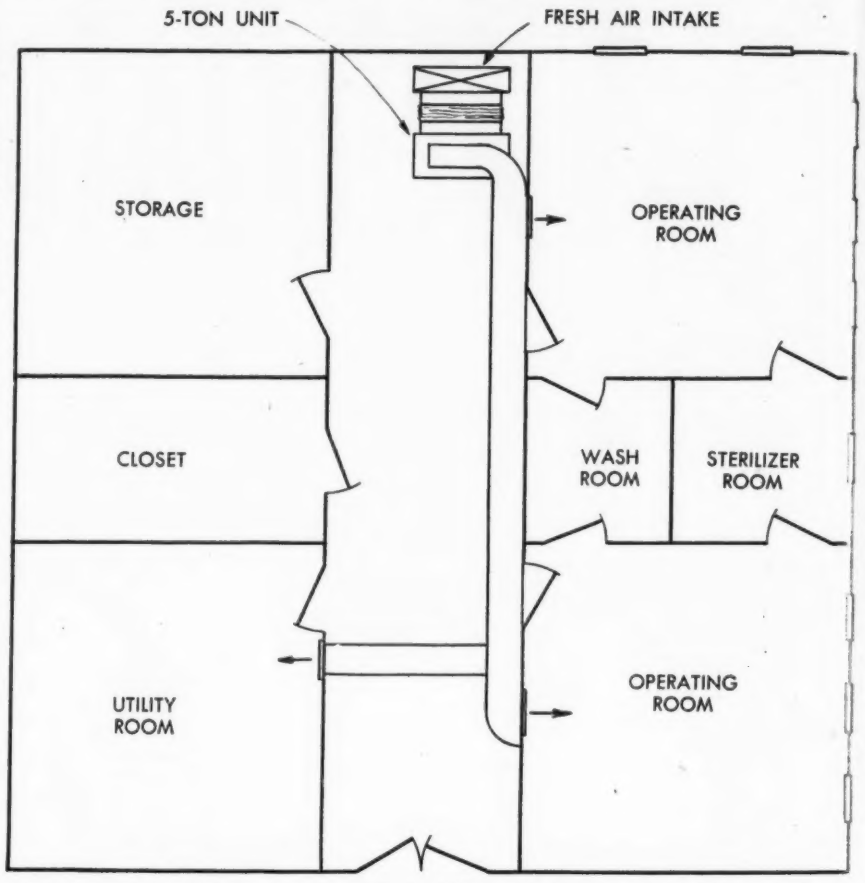
"Due to the unusual conditions for which this air conditioner was to be used, we found that our machine could not be located anywhere in the operating rooms proper," he said.

This is because anesthetics are highly explosive, which made it impossible to place the machine in either of the two operating rooms.

Further, since 100% fresh air had to be put through the conditioner when an operation using anesthetics was in process, it was decided to locate the conditioner in the hall just outside the operating rooms proper.

An outside air intake extends up through the roof above the unit, being tied into the unit with a canvas connection. By means of a manually operated quadrant damper located at the bottom of the air intake riser, the air can be varied from full 100% outside air to 100% recirculation.

The latter arrangement is desirable because the system also air conditions a general utility room directly across the hall from the operating rooms. In this room there is no need to supply 100% fresh air, which, of course, imposes a heavy load on the conditioner.



Standard 5-ton package air conditioner in hallway hooked up with ductwork cools two operating rooms and utility room of Veterans hospital in Sulphur, Okla. Outlet grille for each room is sized to handle complete output, but each can be shut off. Manual damper in fresh air intake permits 100% fresh air when operations are in process, but can be changed to full recirculation at other times.

Supply duct from the conditioner runs down the ceiling of the hall along one side, being lined with 1-in. of cellofoam to prevent any static electricity discharge that might set off the anesthetics.

"The duct is laid out to supply full capacity to each grille," Trahern says. "The reason for this is that when operating in No. 1 (major) or No. 2 (minor) operating rooms, all the air and cooling effect possible is needed since we are circulating 100% outside air."

The grille in each operating room is 12 by 24 in. to handle 2,000 c.f.m., as is the grille for the utility room across the hall. Each grille is equipped with a manually operated shut-off handle which works like the handle of a transom.

"When one room is used, the other two dampers may be closed," says Trahern. "The machine is controlled by two thermostats, one in each operating room, which are tied in series."

BRUNNER SINCE 1906 REFRIGERATION helps you serve better

Maybe we can help if you are having trouble finding the units you need!

With 69 different models, types and capacities of refrigeration condensing units being built on regular production schedules in the Brunner plants, you have more assurance of getting exactly what you need, and when you need it, without wasting time hunting.

What's more, we offer you the help of experienced factory field men backed by an able engineering staff who have encountered and answered just about every kind of refrigeration or air conditioning problem imaginable.

With so much to offer folks engaged in the commercial refrigeration business, it just doesn't make sense to deprive yourself of the advantages that come with recommending and installing Brunner's as a regular habit.

BRUNNER MANUFACTURING COMPANY, UTICA 1, N. Y., U. S. A.

P.S. *As a business man you should talk to a Brunner factory sales engineer. It costs nothing to listen, and you may discover that you have been missing a good bet. Your name and address written on the margin of this ad and mailed to us at Utica is all that is necessary.*

REFRIGERATION CONDENSING UNITS ...a size and type for every purpose

BRUNNER SINCE 1906

AIR AND WATER COOLED MODELS ¼ HP. to 75 HP.

BRUNNER SINCE 1906 AIR CONDITIONING

Self Contained Units in 4 sizes: 3-5-7½ and 10 HP.
Remote Installation Types from 3 to 75 HP.

BETZ BEVERAGE BOX UNIT

FOR INSTALLATION EITHER ON REAR WALL OR EXTREME END

Circulation from top to bottom insures temperature even though the doors remain open. Extremely compact—Will increase bottle capacity of the cabinet.

MODEL NO.	BTU AT 1° TD	CFM	SURFACE SQ. FT.	DIMENSIONS H	W	D
130-DB	130	210	37.24	24¾"	20⅜"	5"
190-DB	190	310	61.83	24¾"	20⅜"	6½"
260-DB	260	425	77.25	24¾"	20⅜"	8"

See Them at Your Wholesalers

BETZ CORPORATION
HAMMOND • INDIANA

THE MOST EFFICIENT DRIER-FILTER MADE

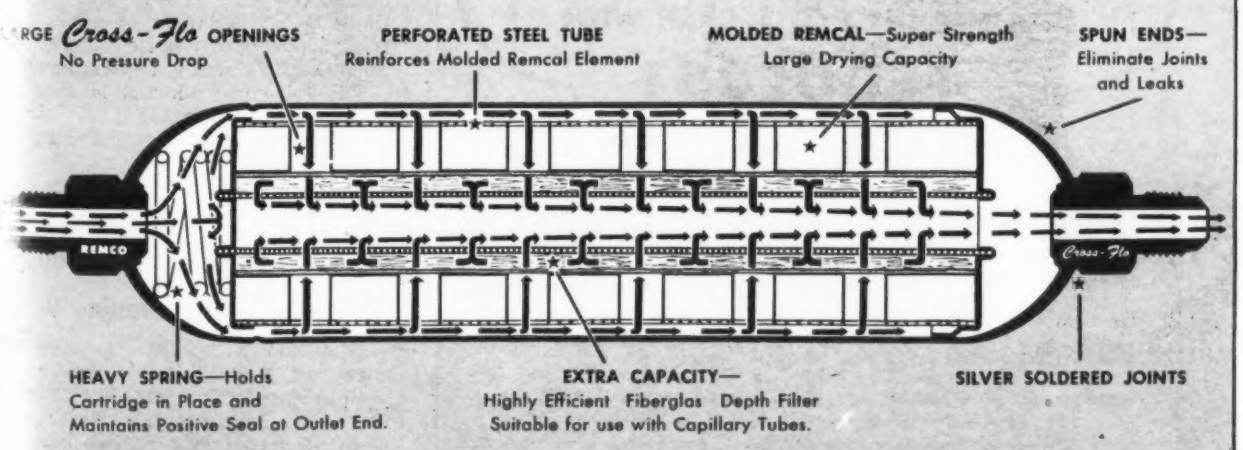
REMCO's IMPROVED "Cross-Flo"

with NEW REMCAL *SUPER-STRENGTH MOLDED CALCIUM-SULPHATE DRYING ELEMENT*

NEW FIBERGLAS FILTER *EXTRA FILTERING SURFACE AND DEPTH for ALL JOBS*

THE *100% FOOLPROOF* HEAVY-DUTY DRIER-FILTER

REMCAL, the *new super-strength* molded Calcium Sulphate drying element, has *increased* moisture absorbing capacity and *improved* efficiency even at liquid line temperatures as high as 150° F. and dew point temperatures down to as low as −60° F. The *new* Fiberglas *depth* filter provides vastly *increased* filtering capacity to take care of even the dirtiest job and *improved* efficiency for even the smallest capillary tube job. The improved design also provides *increased* flow area—pressure drop and premature clogging and plugging are entirely eliminated!



FLOW IS **ACROSS** THE MOLDED ELEMENT—***THROUGH*** THE *Cross-Flo* OPENINGS AND **ACROSS** THE EXTRA CAPACITY, ***HIGHLY EFFICIENT FIBERGLAS*** DEPTH FILTER

REMCAL is a super-strength Molded Calcium Sulphate drying element made from pure Gypsum. It is molded directly into a perforated steel container. It, therefore, has strength approaching reinforced concrete and steel to withstand even the severest shock and vibration. Powdering and dusting are completely eliminated. The element is completely dehydrated at a temperature of 425° F. to assure the highest degree of efficiency. The entire process is performed in our plant under careful supervision to maintain highest possible control of quality. When combined with the Fiberglas *depth* filter, the Molded REMCAL element makes "Cross-Flo" the most efficient drier-filter made—even at liquid line temperatures as high as 150° F. and dew point temperatures as low as −60° F.

CARRIED IN STOCK BY LEADING WHOLESALERS

West Coast Warehouse:
2103 South San Pedro,
Los Angeles, California

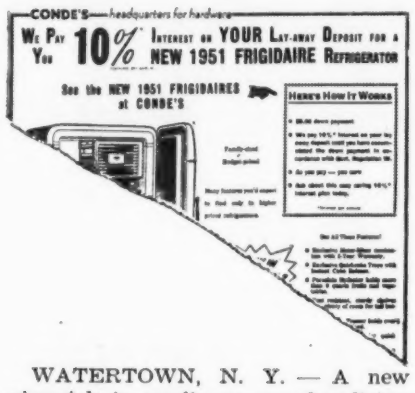
Export Department:
Melchior, Armstrong, Dessau,
Ridgefield, New Jersey

Literature and Prices on request.

REMCO
INCORPORATED
ZELIENOPLE, PENNSYLVANIA

Until Down Payment Accumulates

Dealer Pays Customers 10% Interest on Lay-Away Deposit for New Refrigerator


CONDE'S—headquarters for hardware
We Pay You 10% Interest on YOUR Lay-away Deposit for a NEW 1951 FRIGIDAIRE Refrigerator
See the NEW 1951 FRIGIDAIRES at CONDE'S
Here's How It Works

WATERTOWN, N. Y. — A new gimmick in appliance merchandising was unveiled by Conde's Hardware Store when it announced it would pay 10% interest on a customer's lay-away deposit for a new refrigerator.

Watertown residents were invited to make a $5 down payment on a new refrigerator. The firm then offered to pay 10% per year interest on the lay away deposit until the customer had accumulated the down payment required under Regulation W.

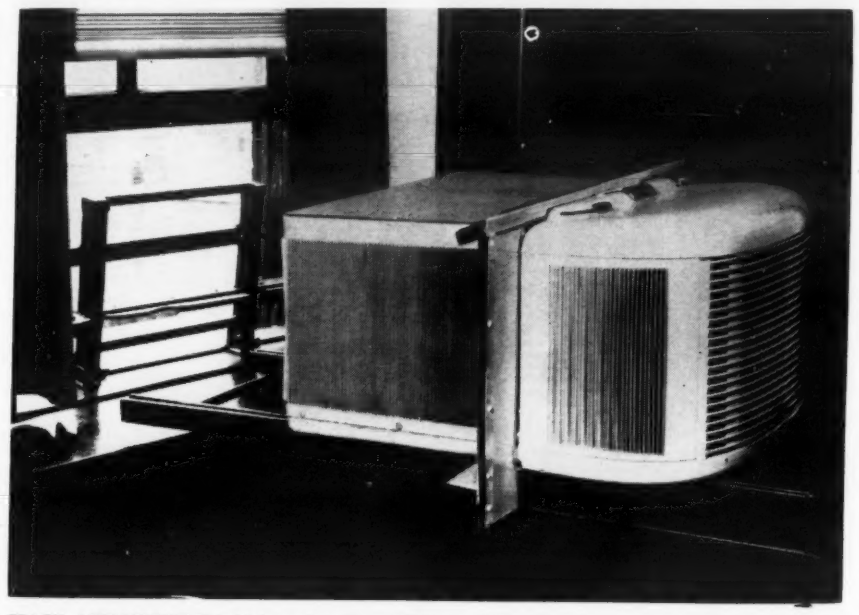
Theme of the promotion is: "As you pay—you earn."

Tied in with the interest gimmick was a trade-in offer in which the store promised "generous allowances." Persons interested in the offer were invited to telephone the store for full information.

Air Cooled Fabrics Store Opens

JACKSONVILLE, Fla.—Air conditioned throughout, the new home of Phelps Fabrics, 321 Ocean St., was formally opened recently.

Casters, Tracks Make Window Units Portable



TRACK ARRANGEMENT which makes it possible to shift units from one window to another.

Cooler Moves from Window To Table to Another Window, All on Wheels

NEW YORK CITY—Window-type room air conditioners can be made "maneuverable" so that they can be shifted from one window to another, or from one room to another, if a little extra work is done at the time of installation, the Thermodyne Corp. here has demonstrated in its installation of window units for the Employes Re-Insurance Corp., 107 William St. here.

The installation consisted of six Carrier ¾-hp. model 51G2 window-type room air conditioners. (It was a third-place winner in the room cooler section of the NEWS' contest for the most unusual air conditioning applications.)

The room conditioners as installed on this job are said to be so maneuverable that one stenographer could remove the unit on the table and trackage arrangement, and then roll it to another office location and place it in another window location which has been fitted for it.

No tools are needed to remove and re-install the unit, and it isn't necessary to unscrew the side panels or remove the window seal.

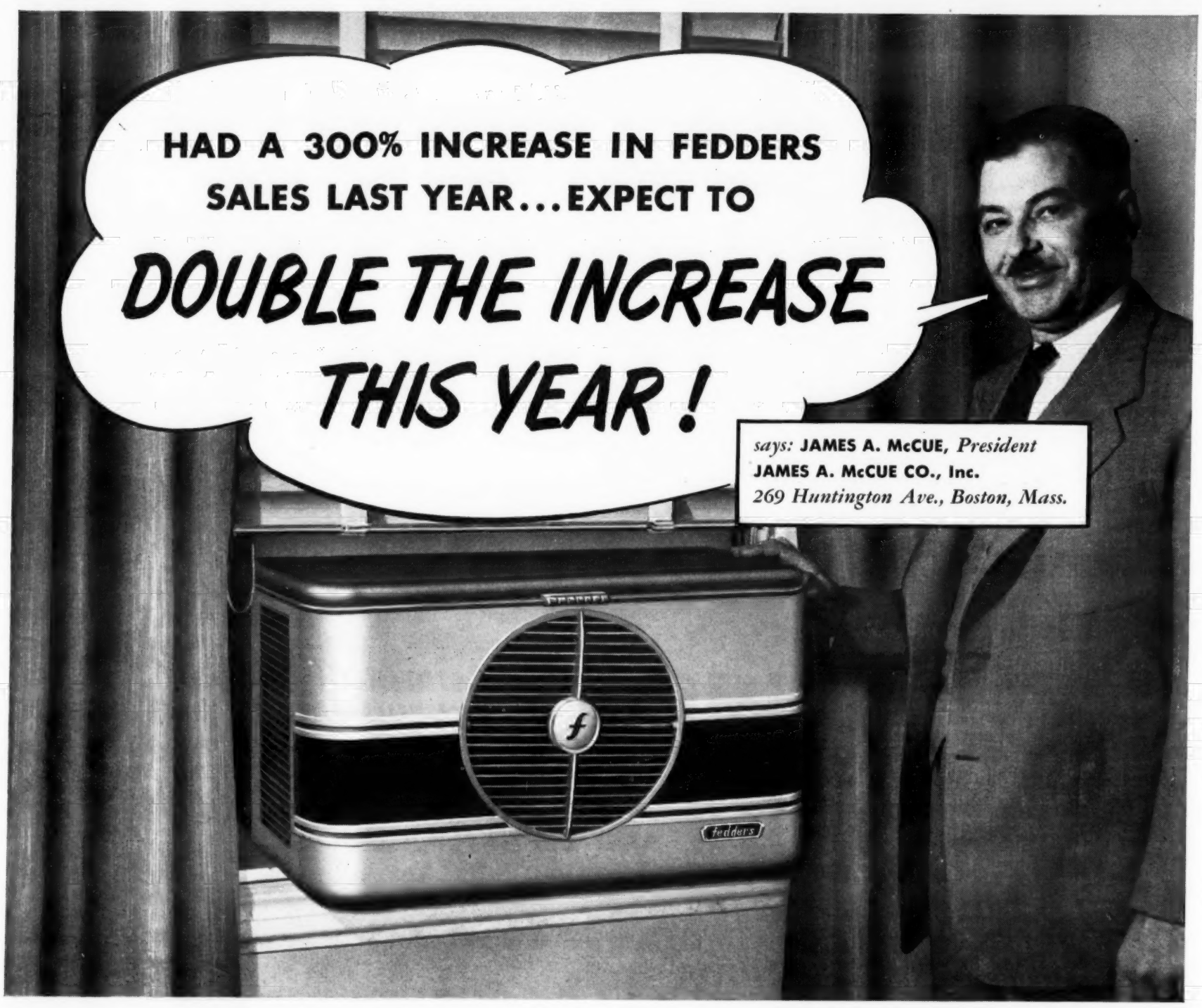
The maneuverability feature of this installation of window-type room air conditioners was accomplished by the development of some special auxiliary equipment.

Units are moved by use of a special reinforced table with casters, which rolls easily from one room to another. This table has an adjustable set of legs, as the height from floor to sill of the windows varied and the table adjusts in increments of 1 in.

Then at each window in which the room conditioner unit may be placed there is placed a trackage arrangement exactly the length of the unit, and this butts into a similar trackage arrangement attached to the roll-a-way table.

Wheels are welded to the bottom of the conditioner unit which permits the unit to be slid in the trackage from the window sill to the roll-a-way table, and vice-versa.

The problem of sealing the window frame once the unit was slid into place in the window was a difficult one. It was solved by cutting the wing panels to the exact dimensions of the spaces that would remain after the unit was put into position. Attached to these wings and to the unit is a live rubber sealing gasket similar to that used on refrigerator doors.


HAD A 300% INCREASE IN FEDDERS SALES LAST YEAR...EXPECT TO
DOUBLE THE INCREASE THIS YEAR!
says: JAMES A. McCUE, President
JAMES A. McCUE CO., Inc.
269 Huntington Ave., Boston, Mass.
fedders

SALES OF FEDDERS ROOM AIR CONDITIONERS WENT UP 300% all over the country in 1950...while industry sales were up only 100%. This year defense and civilian needs are bound to increase sales more than ever for Fedders dealers.

1. Fedders completes its brand-new line for 1951 with a new, low-priced ⅓ ton capacity unit that will enable defense and civilian workers to work and sleep in cool comfort. Also ½ and ¾ ton window models, plus efficient 1 and 1½ ton console models.

2. The fast-growing room air conditioner market has expanded to include hospitals, scientific laboratories, defense plants, and other places where air conditioning can help people work better and feel better by keeping cool.

3. Fedders advertising, packed with timely information about the benefits of air conditioning and Fedders' exclusive features, is appearing in big space in magazines and on radio and TV.

4. Fedders offers two completely worked out plans that will bring people into your store to see for themselves how Fedders has cut the cost of air conditioning for America.

fedders

A GREAT NAME IN COMFORT

MAIL THIS COUPON NOW!

FIND HOW YOU CAN TURN HOT HUMID WEATHER INTO COLD CASH WITH FEDDERS!

Fedders-Quigan Corporation, Unit Air Conditioner Division
Dept. AC-4, Buffalo 7, New York

Gentlemen: Please send me complete information on how I can make extra profit selling the 1951 line of Fedders Room Air Conditioners.

Name _____

Company _____

Address _____

City _____

County _____ *State* _____

Can You Supply Catalogs, Mechanical Data to Engineer on Okinawa?

TOKYO, Japan—A call for assistance in the form of refrigeration and air conditioning catalogs, engineering literature, and manuals has been sounded by Stanley de Waal, Chief of the Mechanical Branch, Okinawa Engineering District, U. S. Government.

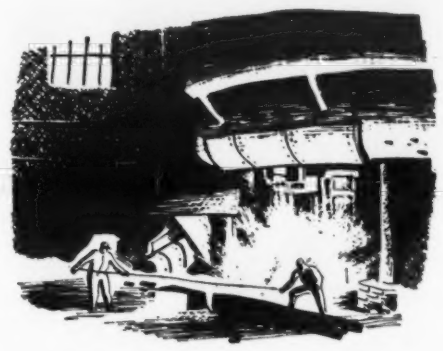
A subscriber to the NEWS, de Waal has written to state that "we are in the process of designing of air conditioning, dehumidifying, refrigeration, heating, and sanitary equipment for many structures to be built on Okinawa. I have the idea that perhaps you could help us in securing catalogs, literatures, and manuals, which information in turn would be engineered into these jobs. Should there be any charges or expense in this connection, please advise the amount and I will gladly reimburse."

The following address is given:

Stanley de Waal
Okinawa Engineering District
Tokyo Sub-Office
A.P.O. 500
c/o P.M. San Francisco, Calif.

Whitmyer Named Comptroller For G-E Air Conditioning Dept.

BLOOMFIELD, N. J.—Appointment of Russell E. Whitmyer as comptroller of the General Electric Co.'s air conditioning department with headquarters here, has been announced by F. J. Van Poppelen, general manager. Whitmyer succeeds Paul E. Mills who has been transferred to the main office of the company in New York.



What! Air condition a furnace full of white-hot metal?

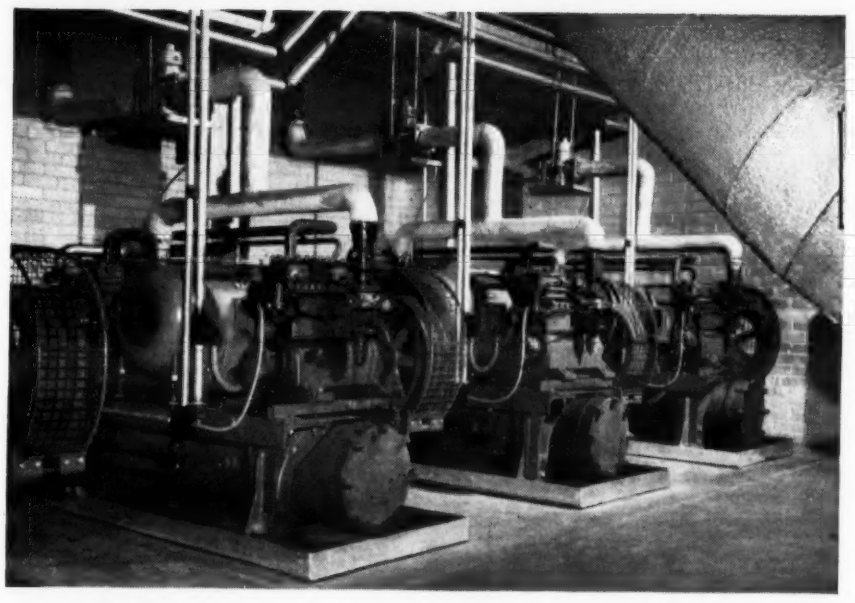
Sounds fantastic—yet it's actually only one of the *many* ways in which Frigidaire Air Conditioning is serving American industry today.

The pictures on this page show just three of the scores and scores of Frigidaire installations in factories all across the nation. These installations differ greatly in size and purpose. But all have one thing in common—

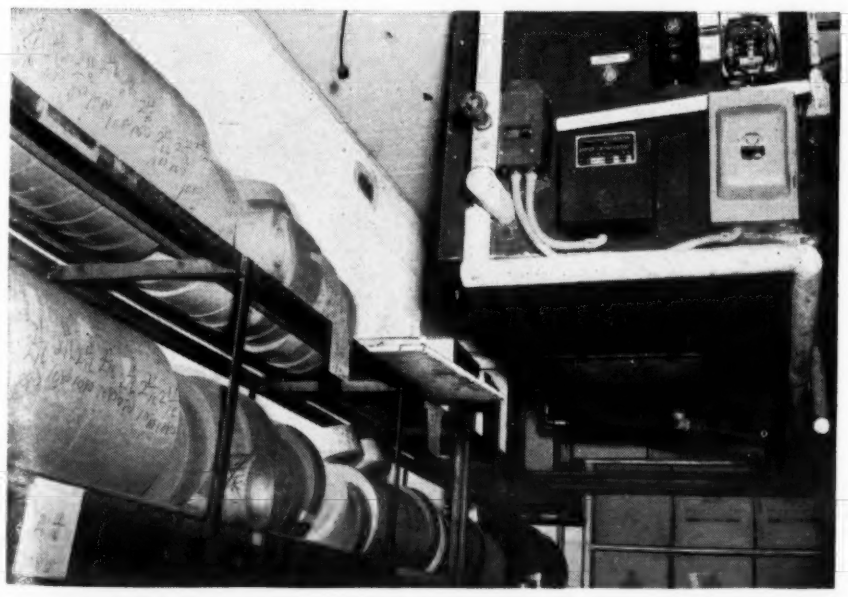
In every case, Frigidaire Air Conditioning is helping industry do a better production job.

How? By speeding up production—by cutting down on costly waste of materials and manpower—by assuring uniformly high product quality.

To American industry, this ever-increasing industrial use of Frigidaire Air Conditioning means better products at lower cost. To the entire nation, it means more efficient production of the goods we need for homes, farms, businesses—and for defense.



LESS WASTE. This Frigidaire installation has cut cast-iron scrap losses in half for an Indiana foundry. The equipment shown here cools and dehumidifies the air fed into the cupola. A more conventional way in which Frigidaire Air Conditioning is used to reduce waste is in the protection of valuable inventories from the inroads of heat and humidity.



FASTER PRODUCTION. Damp air causes insulating paper used in electric motors to swell—resulting in production slowdowns and stoppages. The remedy: a storeroom like the one shown here, where Frigidaire Air Conditioning always keeps the paper at just-right humidity—never too damp and never so dry that it can crack and cause short circuits.

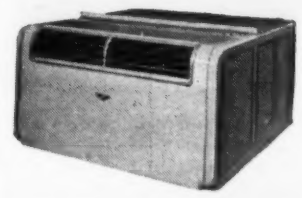
HIGHER QUALITY. The electro-limit gauges these girls are using can measure to 1 200,000 of an inch, but they would be useless if the temperature of the tested parts wasn't kept absolutely uniform by dependable Frigidaire Air Conditioning. Frigidaire equipment plays an important part in many precision operations where exact control of heat, humidity and dust is vital.

Frigidaire Air Conditioning and Refrigeration

Over 400 products—most complete line in the industry

The uses for Frigidaire air conditioning and refrigeration products are almost without limit. They serve industry wherever temperature and humidity must be controlled: For food and drug processing, packaging and storage. For the storage and handling of paper, plastics, rubber, waxes, and other materials affected by temperature or moisture changes. For controlling the conditions in which instruments, electronic equipment and other precision products are manufactured and inspected. For simulating test conditions in research laboratories. For food preservation in plant lunchrooms. For storage of biologicals in hospitals and industrial medical departments. For water and liquid cooling. For contributing to the health, efficiency and comfort of employees.

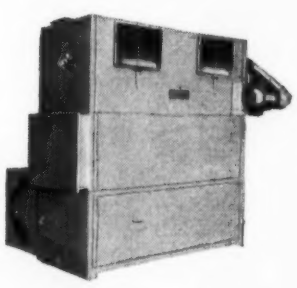
Frigidaire's Complete Line of Air Conditioning Products Includes:



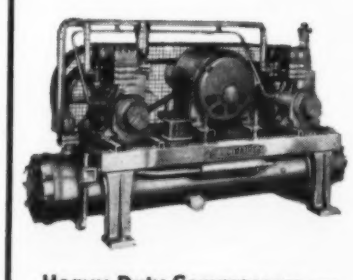
New Room Air Conditioners. These compact window units are easily installed—do a complete air conditioning job. They're powered by Frigidaire's famous Meter-Miser mechanism which is backed by a special 5-Year Warranty.

Self-Contained Units can be installed in a few hours. Used singly or in multiple, they provide fast, low-cost cooling for a wide range of applications in business and industry.

Heavy-Duty Self-Contained Unit is quickly installed—ideal for factories, offices, department stores, or any other single application requiring large capacity in a single unit.

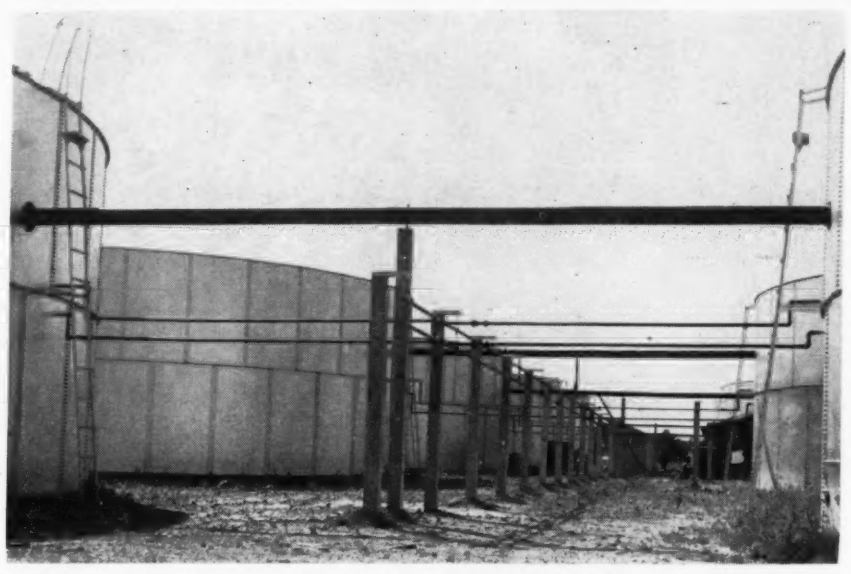


Central System Air Conditioners range from 7- to 40-ton capacities. Available with dual steam distributor tube heating coils and humidifier assembly for winter use.



Heavy-Duty Compressors are available in sizes up to 25 H. P. Designed for perfectly balanced operation with Frigidaire controls and cooling units.

HUGE STORAGE TANKS at Erie Ordnance Depot, Lacarne, Ohio. Equipment, principally anti-aircraft guns, is placed on standard steel plate bottoms, resting on reinforced concrete. Wall is then built up around the guns in cylinder form. Asphalt mastic vapor seals the bottom of the ordnance tank. Two inches of Fiberglas have been used to insulate sides and ceilings.



COMPLETED TANKS built close together have ductwork, brine piping, and supporting concrete posts. Neutral calcium chloride brine is circulated through these pipes from central refrigeration plant. Big problem was to get proper amount of refrigerant to each tank because each is individually controlled.

Cooled, Dehumidified Tank Farm Stores Anti-Aircraft Guns

$25,000,000 Worth of Equipment Kept In Readiness at Ordnance Depot

By John O. Sweet and George M. Hanning

LACARNE, Ohio—Extensive dehumidification and refrigeration systems are preserving $25,000,000 worth of anti-aircraft guns in a constant state of readiness at the Erie Ordnance Depot near here.

The equipment is stored in a cluster of 49 prefabricated steel tanks originally procured by the Department of the Army for overseas shipment to hold petroleum products.

Thirty-five of the tanks are 29 ft. in diameter and 14 are 55 ft. in diameter. All are 16 ft. high.

The pilot tank "farm" was constructed and the war materiel put under cover during 1947. Just recently, six of the tanks were opened and the guns to found in excellent condition, according to Col. E. M. Webb, commanding officer of the depot.

Depot officials are highly pleased with the performance of the tank storage system, for it more than cut in two the warehousing space normally needed for the guns, saved money on up-keep costs, and allows the equipment to be brought into service in a minimum amount of time.

The tank farm is one of the latest developments for long-term storage of ordnance materiel. The Erie farm is one of eight in the United States set up by the Army Ordnance Corps to preserve World War II surplus equipment for emergency use at a cost which is an infinitesimal percentage of its replacement value.

Research by the Army Ordnance Corps determined that an average daily moisture content of 30% r.h. or less at any given temperature would be sufficient to store materiel indefinitely.

Equipment Holds 30% R.H. With 68° F. Temperature

The tanks, therefore, were equipped with dehumidification equipment to prevent relative humidity from rising above a daily average of 30%. In addition, at Erie, a maximum dry bulb temperature of 68° F. was specified.

All of the tanks at Erie are erected with standard steel plate bottoms resting on reinforced concrete slabs 6 in. in thickness and vapor sealed around the bottom with asphaltic mastic. The joints in the tanks are of overlapped bolted form and sealed with neoprene gaskets.

The volume of each 55-ft. steel tank is approximately 40,000 cu. ft. and the smaller tanks 12,000 cu. ft. for a total storage space of 980,000 cu. ft.

Each tank is lined with a 2-in. layer of Fiberglas sealed to the sides and ceilings. Painted with aluminum paint to deflect the sun's rays, the 14 large tanks each required 5,400 sq. ft. of insulation and the 35 small tanks 2,700 sq. ft. for complete coverage. Seams are covered with a 2-in. width Fiberglas tape brushed on with a special paste.

Four Dehumidifiers Used

Dehumidification is accomplished by four 500 c.f.m. Lectrodryer units. Two are located in a small cement block house in the midst of the large tanks. These units are connected by pipe with each 55-ft. tank.

The other two D-50 Lectrodryer units are housed individually and between them handle all of the smaller sized tanks.

Both the dehumidification system and the refrigeration system were installed by Carr & Sons, Toledo refrigeration contractor.

Refrigeration is provided to each of the tanks through an elaborate piping system. Neutral calcium chloride brine is circulated through these pipes from a central refrigeration plant to diffusers mounted near the ceiling in each of the tanks.

In the refrigeration building are located four Sterling ammonia compressors of 31.4 tons capacity each, two 70-ton Baltimore Aircoil evaporative condensers, a liquid receiver, a brine surge tank, a Baker shell and tube brine cooler using 38° F. brine (returning brine 48 to 50° F.), circulating pumps, water cooler, and other equipment.

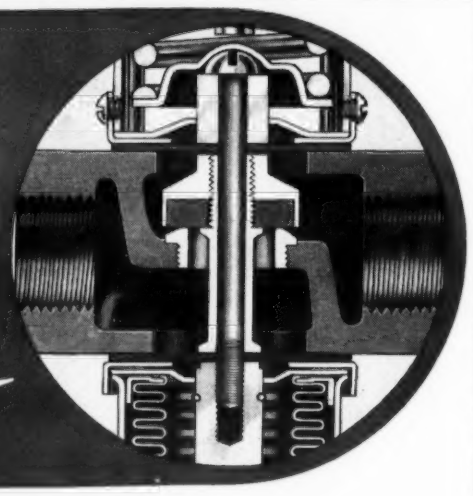
The system is so designed that it can maintain any predetermined temperature in any one tank or group of tanks, depending on the needs of the particular tank, according to Charles B. Carr.

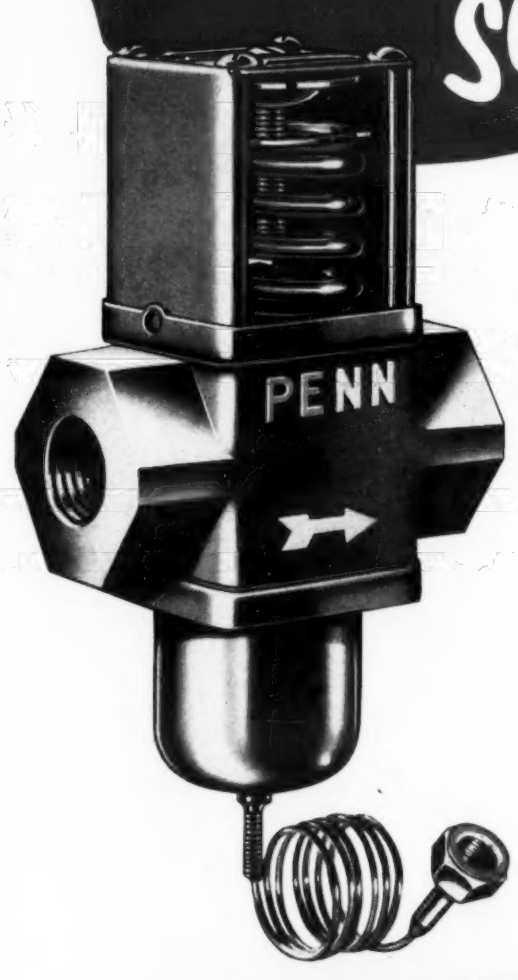
Varying Distances Cause Problem

Big problem on this job, he said, was to get the proper amount of refrigerant to each of the tanks. Each tank is individually controlled for

(Concluded on next page)

here's the secret!





WHY PENN WATER VALVES STAY ON THE JOB LONGER

It's really very simple . . . yet so very effective. PENN's unique design incorporates two nylon-reinforced synthetic rubber diaphragms (shown in the cut-away view) to keep water *out of the bellows, range spring and sliding parts.*

Thus, these important "working parts" are free from the destructive effects of sedimentation and abrasive deposits which cause premature wear and water valve failure.

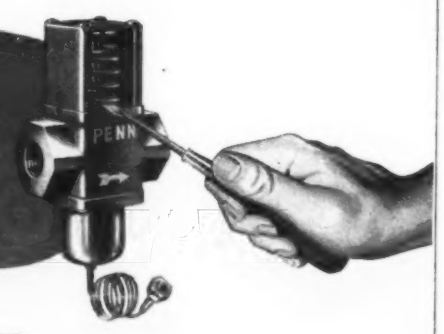
But that's not all! The scientific design of the PENN Series 246 water valve eliminates water hammer . . . sticking of seats . . . need for lubrication. And, it is highly sensitive to changes in refrigerant head pressures to assure highest efficiency.

These better PENN Series 246 water valves are built in sizes from ⅜" to 2½" and in flanged or threaded styles. Ask your wholesaler or write **Penn Electric Switch Co., Goshen, Indiana.** Export Division: 13 E. 40th Street, New York 16, N. Y., U.S.A. In Canada: Penn Controls Limited, Toronto, Ontario

EXTRA FEATURE

Easy Manual Flushing

The PENN Series 246 water valve may be flushed manually by inserting screwdriver, or similar tool, under the main spring and prying it upward (away from valve body).

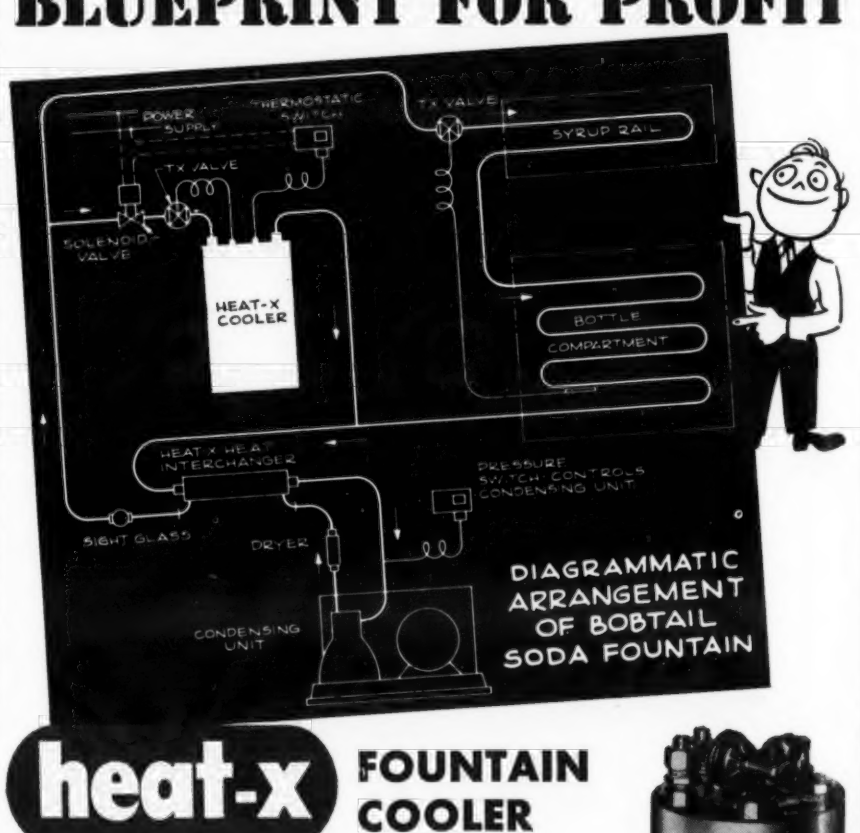


PENN

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, PUMPS, AIR COMPRESSORS, ENGINES, GAS RANGES

BLUEPRINT FOR PROFIT

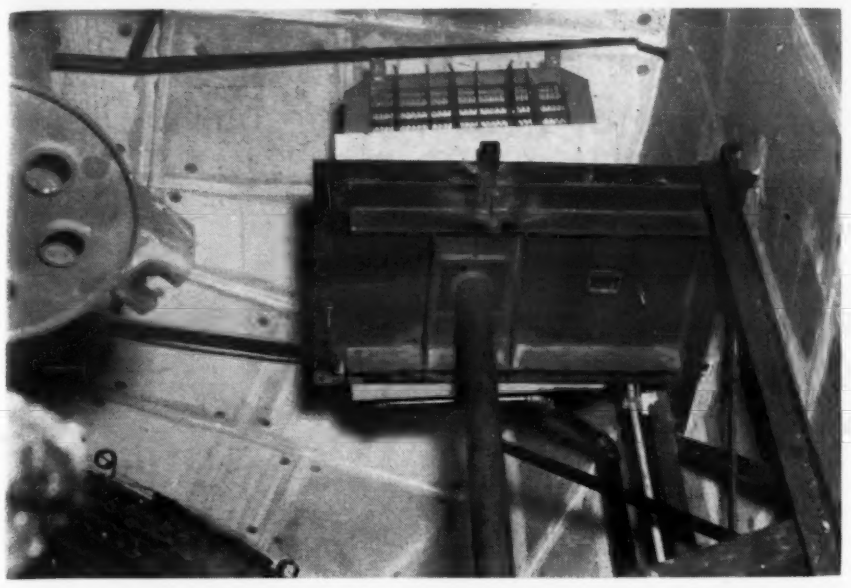


heat-x FOUNTAIN COOLER

The simple, common-sense construction of Heat-X Fountain Coolers insures minimum maintenance and positive protection against freeze-up damage. Cast within the aluminum block are (1) a stainless steel coil for soda, (2) a copper (or stainless steel) coil for water, and (3) a copper coil for refrigerant. No surge tank or oil separator is required. The hook-up for a bobtail soda fountain is shown in the diagrammatic sketch above.

Write Dept. SE for Specification Sheet

THE HEAT-X-CHANGER CO., INC.
BREWSTER, NEW YORK



VIEW OF AIR COOLER installation inside steel storage tank. Diffuser is placed near ceiling on an elevated platform. Brine is circulated from central plant to individual diffusers. According to Charles Carr, Carr & Sons, refrigeration contractor of Toledo, the system was designed to hold predetermined temperatures in one tank or a group of tanks.

System Holds 68° F. with Ambient of 98° F.

(Concluded from preceding page)

temperature and humidity and each varies in its distance from the refrigerating machinery.

For the solution, Carr drew way back into his 25 years' experience with ammonia and pulled out a trick he learned in the early days.

That was to insert a stainless steel disc in the face of the gasket in each union where the refrigerant piping entered the tank. In the center of the disk was a round hole. The size of this hole varied with the amount of refrigeration needed and adjusted the pressure of the flow accordingly, Carr said.

As has been proved over a long period of time, the idea has worked out very satisfactorily.

The refrigeration system was first placed in operation at the beginning of June, 1948 and continued in operation that year until Oct. 12. During the greater part of the summer, refrigeration was supplied to the tanks from 8 a.m. to midnight, seven days a week.

During hot weather, this method of operation left a residual heat load in some of the tanks slightly higher than 68° F. (generally from 70° F. to 73° F.). During the latter part of the summer the system operated 24 hours a day.

Actual temperatures within the tanks were logged daily and it was found that the system was capable of maintaining temperatures below 68° F. within the tanks with ambient temperatures of 95 to 98° F.

Cost of operating the refrigeration system per year is estimated as follows: Labor $8,892; power $7,450; maintenance and operating supplies, $1,000; total, $17,342.

One interesting aspect of installation was the problem of loading the tanks. Shop personnel disassembled and palletized the anti-aircraft guns for storage and arranged them on pallets on the tank bases. Rubber tires and wheel assemblies of the units were stored with the weapons. Recoil mechanisms, however, were stored in a heated warehouse where they are regularly exercised.

Sides and ceilings of the tanks were erected by the contractors after the guns were placed in position.

Unloading the tanks is something else again. For this, the roofs have to be removed and the entire pallets lifted over the walls by a 75-ton crane.

Prime contractor for the construction of the tank farm was the Robert Carter Co. of Toledo.

Col. Webb stated that the depot expects to use the tanks over and over again for storage purposes, even after the anti-aircraft guns are removed. Continued use will bring greater savings to the taxpayers.

DEHUMIDIFICATION SHELTER house shows location of Lectro-dryer unit. There are 3 such shelters for the installation. Two contain one drier each of 500 c.f.m. capacity which handle the smaller tanks. One has two units to handle the larger tanks.

Acme Eliminates Gasketed Joint on Liquid Coolers; Other Improvements Made

JACKSON, Mich.—Alwin B. Newton, vice president of engineering at Acme Industries, Inc., has announced that several refinements are being made on the Acme Dry-Ex liquid cooler.

This is a unit which is used to cool liquids such as water, brine, oil, alcohols, or glycols and has capacities up to 200 tons of refrigeration.

A steel pipe nipple is now being welded to the cast steel refrigerant head. The advantage of this connection is that it serves to eliminate a gasketed joint which was previously inaccessible.

The connection is reamed out on the end to fit the o.d. of copper tubing, Since the test cap is silver soldered in place, it may be removed and the field connection made in one heating operation when a copper suction or liquid line is to be silver-soldered to the chiller connection.

Thirdly, field connections may be made of steel pipe or tubing welded directly to the nipple on the chiller, which is scarfed for welding.

Dry-Ex chillers will be furnished with the old flanged type construction of refrigerant connections to balance out the present inventory of machine castings. They will then be furnished with the improved type.

JUST ASK US!
Turn to "What's New" page for useful information.

Armstrong Cork Buys Asbestos Supply Cos.

LANCASTER, Pa. — Purchase of the low and high-temperature insulation business assets of the Asbestos Supply Cos. of Seattle, Spokane, Tacoma, Oregon, and Alaska by the Armstrong Cork Co. has been announced by H. R. Peck, vice president and general manager.

Armstrong Cork said it will carry on the business under its name. The new business will be operated by Armstrong as a district office located in Seattle with branch offices in Portland, Spokane, Tacoma, and Anchorage, Alaska.

A. J. Stream, formerly general manager of the Asbestos Supply Cos., will continue to manage the business as Armstrong district manager located in Seattle.

A. M. Fisher, formerly assistant manager of Armstrong's Building Materials Division New York office, will now be assistant manager at Seattle.

Redmond
MICROMOTORS
Prompt shipment!
74 different models in stock
FACTORY DISTRIBUTORS
CYCLO-FREEZ CORP.
2120 S. Lyndale, Dept. A, Mpls. 5, Minn.

Number 1 of a series of advertisements which dramatize the essentiality of the air conditioning and refrigeration industry.

Appearing in *The Saturday Evening Post, Time, Newsweek, U. S. News & World Report, Business Week, Wall Street Journal, The Christian Science Monitor.*

Air conditioning and defense

America is getting ready to cope with whatever may come. Factories all over the land are turning from peacetime production to defense production. And even the most sanguine hopes of avoiding total war are tinged with the urgent need for preparation.

Here at Carrier, we are beginning to make "tanks and guns." But we are also making air conditioning and refrigeration equipment, firm in the belief that this is also essential to the defense of our country.

The job air conditioning and refrigeration can do was made crystal-clear during World War II. Carrier equipment functioned on beachheads and on battleships. In plants everywhere, it was a production tool — helping make things *faster, better, cheaper.*

By providing constant temperature and humidity, it kept hundreds of precise parts corrosion-free and to close tolerances — speeding the mass production of aircraft engines.

By cooling brine to 85 degrees below zero, Carrier equipment helped turn out an ever-increasing volume of synthetic rubber.

It preserved food for safe transportation throughout the world. It was vital in the production of radar and optical equipment, electronic devices, synthetic fibers, high-octane gasoline, sulfa, penicillin and scores of other key products.

Most of these wartime applications were merely extensions of our normal business. True, the end result was sometimes different. But the equipment was the same and it had the same job to do.

Right now a lot is being said about defense needs versus civilian needs. Actually, the line between the two is often hard to draw. And this is particularly true in our business.

Is air conditioning a textile plant a civilian use of air conditioning? That plant may quickly be required to step up production. For both soldiers and civilians must be clothed.

Is refrigerating a food processing plant a civilian use of refrigeration? The increased output of that plant may soon have to be divided between fighters and workers.

What about air conditioning the space in which delicate gauges are to be stored? Is this more important than making bearable the hot and humid room where men are working around the clock on defense planning?

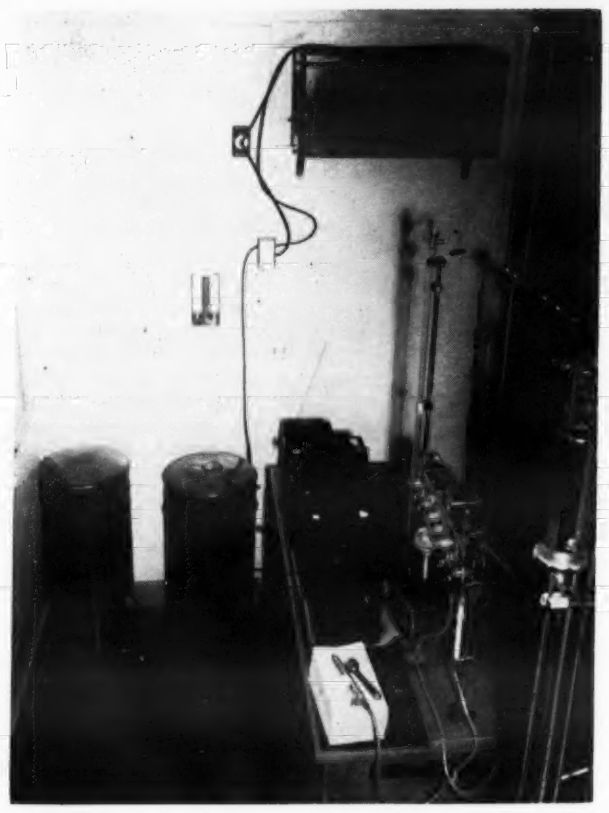
These problems must be resolved by answering this basic question — will air conditioning get the job done *faster, better, cheaper?*

The thing that counts is productivity. For productivity is America's strongest defense.

Carrier

AIR CONDITIONING · REFRIGERATION

Chemical Lab Solves Heat, Humidity Problem With Window Air Conditioner, Dehumidifiers



IN ORDER to have testing equipment function properly, temperatures must be held at 77° F. and relative humidity at 50% in this chemical laboratory. A Frigidaire 1-hp. window air conditioner and 2 dehumidifiers licked the problem completely. Excessive heat is generated in the 6 by 14-ft. room by a 750-watt amplifier, a vacuum pump motor, an infrared light burning at 1,000° F., and the operator.

(See picture at left)

ABBEVILLE, La. — A 1-hp. window air conditioner used in combination with two self-contained dehumidifiers neatly and inexpensively solved an important temperature and humidity problem for the chemical laboratory of a local oil company, according to C. T. Hill of 241 Appliance Center, appliance dealer here, who installed the equipment.

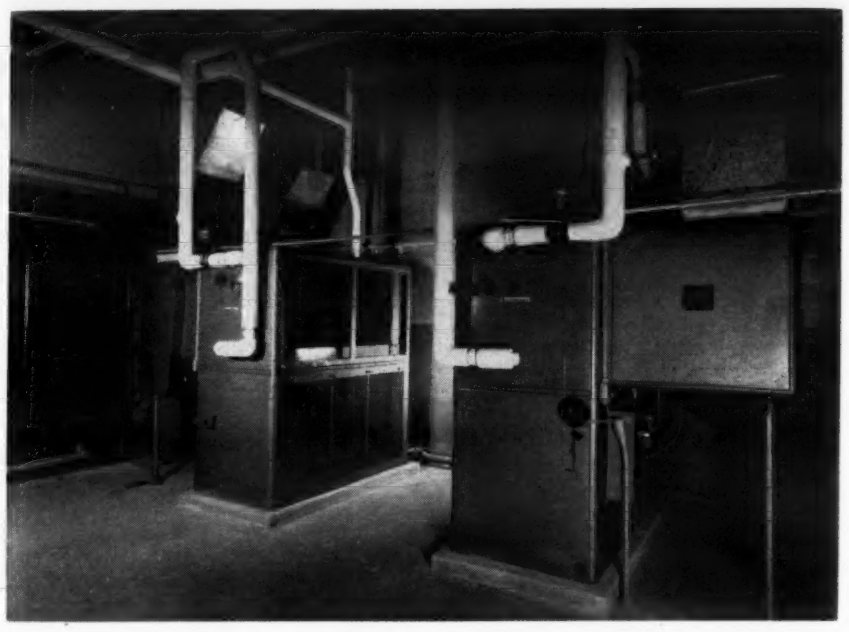
"Although the entire laboratory is cooled with a 7½-hp. air conditioner, the use of an infrared spectrophotometer made it necessary to build a special 6 by 14-ft. room within the laboratory," Hill explains. "This instrument is used in the oil industry to analyze gases and liquids to determine the per cent of each component to be found in a given gas or liquid.

"In order for this intrument to function properly and to prevent damage to the rock-salt lens and prism, the relative humidity has to be kept at 50% or lower and the room temperature must not exceed 77° F. Heat is generated in the special room by a 750-watt amplifier, a ¼-hp. vacuum pump motor, an infrared light source burning at 1,000° F., and the operator.

"We installed two BK-1 Frigidaire dehumidifiers which brought the relative humidity down to the required operating point, but raised the temperature due to the heat generated by the dehumidifiers.

"We knew we had the humidity problem licked, and by simply installing a 1-hp. Fridigaire ARL-100 air conditioner in the window, we were able to keep the room temperature at 77° and the humidity below 50%. The three pieces of equipment run continuously."

43 Package Units Cool 300,000 Sq. Ft. Of Space at Ford Motor Parts Depot



PART OF the installation of 43 packaged air conditioners installed at the Central Parts Depot of Ford Motor Co., Detroit. The units cool office and cafeteria space. Hot water coils supply heat during winter months.

DETROIT—Simplified engineering, installation, and maintenance are advantages cited for the unusual 650-ton air conditioning arrangement devised for the huge Central Parts Depot of Ford Motor Co. here.

Instead of using a central system, 43 Nevinger package air conditioners ranging in size from 3 to 20 tons were installed to cool more than 300,000 sq. ft. of office and cafeteria space in the new structure. Each unit is equipped with hot water coils, as well as cooling coils, compressor, and shell-and-tube condenser.

Several advantages of using package units in an installation of this type were cited by the installer:

"Each unit is completely automatic, and therefore no operator is required. Repairs and maintenance are limited to the replacement of standard parts, which are 'jobber items' by regular refrigeration maintenance men, not factory engineers. In the event of a unit failure, only a small percentage of the cooling would be lost. This would hardly be noticed by the occupants.

"No expensive refrigeration engineering was required in the layout and design of the building by using the factory-assembled units. This also eliminated expensive refrigeration field work," he says.

The installation was made by J. Brodie & Son under the direction of John J. Kramer & Associates. The Austin Co. was the general contractor for the structure which contains over 1,000,000 sq. ft. of floor space. The building is 720 by 1,280 ft. in size, being constructed of brick, cinder block, and glass with an insulated steel deck flat roof.

Front portion of the office space consists of two floors each 70 by 720 ft. divided into many general and individual offices.

"The front of the buildings faces south and presented quite a problem in zone control, both for heating and cooling," explains Kramer.

Three fan rooms serve each floor, and in each fan room are installed several package air conditioners. These conditioners draw return and fresh air from the return air plenum and distribute it through individual ductwork.

The front office space is divided in this manner into 19 separate zones for individual control.

Central office space consists of an area 220 by 720 ft. with a 16-ft. ceiling. Partitions 8 ft. high divide this area into various offices.

Package air conditioners of 20-ton capacity were located in the central office area, being installed above the partition level. With this arrangement the units distribute the air uniformly over the entire area without the expense of resorting to ductwork, Kramer points out.

Similar 20-ton package units were employed for the cafeteria, although here the units were connected up with ductwork.

American Stove Produces New Conditioner Along With Defense Contracts

JERSEY CITY, N. J.—Three defense contracts equal to three times the total of civilian production cutbacks have been awarded to American Stove Co., according to Marc W. Pender, vice president.

Pender said at a stockholders' meeting here that the contracts are for the manufacture of rocket head assemblies, fighter plane fuel tanks, and fire bombs.

He also reported that American Stove plans to bring out new stove models soon despite a 20% reduction in output forced by restrictions.

Pender further noted that the company had gone into "token" production of its new Magic Chef air conditioner. American Stove announced earlier that the unit would be produced on an experimental basis.

HENRY REALLY GIVES YOU SOMETHING EXTRA!

ADVANCED ENGINEERING

1 RELIEF VALVES diaphragm construction, positive controlled cushion reseating with relief capacity that meets latest code requirements.

2 WING CAP VALVES greater flow, bolted bonnet and self-aligning stem disc.

3 PACKLESS VALVES still the only Balanced-Action valve on the market—no extra cost.

4 DRIERS forged brass end caps with integral fittings, natural finish, Abso-Dry pressure sealed, dispersion tube and extra capacity.

5 AMMONIA VALVES compact and strong, self-aligning stem disc.

6 STRAINERS forged brass end caps with integral fittings, reinforced screen, large filtering area, distortion-proof clean-out flange.

Sold by Leading Wholesalers

HENRY VALVE CO.

Valves • Driers • Strainers • Control Devices and Accessories for Refrigeration, Air Conditioning and Industrial Applications

MELROSE PARK, ILL. (CHICAGO SUBURB)
CABLE: HEVALCO, MELROSE PARK, ILLINOIS

HENRY VALVE CO CONTROLLING FLOW SINCE 1914

Stores More in Less Space... Cools Faster!

Speed-Freeze

bottle beverage coolers

write IDEAL COOLER CORPORATION
2953 EASTON AVE., ST. LOUIS 6, MO.

What size cold plate do you need?

WE CAN SUPPLY THEM "Job Tailored" TO YOUR REQUIREMENTS

Yes, Dean makes a specialty of producing plates in the exact size you need for a particular job. You name the size — we make it. You can have plates made in zinc metallized steel, stainless steel, and in other metals. You can get cylinders, U's, angles, tanks, etc. Also plates for baudelot-type coolers.

SEND FOR TECHNICAL DATA BOOK

DEAN PRODUCTS, INCORPORATED
1042 DEAN ST., BROOKLYN 16, N. Y.

'To Fly Faster, Higher, Safer'

Air Conditioning Speeds Aeronautical Advances

In the Lewis Laboratory and at Wright Field Air Conditioning Simulates Conditions Met Anywhere On or High Above the Earth

One of the most famed planes in the Air Force's postwar history—a big bomber that had set records and which had cost several hundred thousands of dollars to build—caught fire in flight and was destroyed.

Fortunately the crew was saved and was able to report on the cause of the fire—failure of a $2.50 circuit switch.

A navigator in a transatlantic plane went up into the plane's astrodome to take a navigational reading. Suddenly the plastic cover broke off and the air pressure from within the pressurized cabin catapulted the navigator to death from the plane.

Hurtling along high in the sky a turbo-jet fighter plane suddenly plunges towards the earth—all power lost from a turbo-compressor "blow-out."

These disasters that brought loss of life, and loss of government and private property, were the result of failures of materials and component parts in aircraft at certain altitude, temperature, and relative humidity conditions.

Such disasters are not likely to occur again, thanks in part to the facilities which modern refrigerated air conditioning equipment, techniques, and practices afford, because it is possible to simulate the conditions in ground laboratories that will be encountered in flight.

This means that materials and components for aircraft can be tested without danger to human lives or the possible loss of expensive and valuable finished aircraft.

These test facilities are to be found in the Lewis Flight Propulsion Laboratory operated in Cleveland by the National Advisory Council on Aeronautics, and at the environmental and materials testing laboratories operated by the U. S. Army Air Force at Wright Field in Dayton.

Refrigeration and air conditioning for both of these laboratories is furnished by Carrier Corp. equipment—the one at Lewis Laboratory laying claim to being one of the world's largest installations.

The general purpose of this laboratory activity is succinctly summed up by Lewis Laboratory Director's Dr. Edward R. Sharp and his first assistant Abe Silverstein, as getting "our planes to fly faster, higher, more economically, and with greater safety."

To achieve these goals, the laboratories help to lay down the basic research, in combination with the industry and the armed forces.

Later materials and components are checked and tested, and then the finished equipment is again checked to make certain that none of the proved theoretical design principles were lost in actual production. Then comes a "final evaluation" check, and then, if any defects show up in operation, further testing may be necessary to determine the reasons for the defect, and corrective measures to be adopted.

What is the nature of the problems confronting aeronautical design engineers that these laboratories, with their provision for simulated environmental conditions, help to solve? They can probably best be described in various categories:

1. Problems of altitude.

Within the last five years, the altitudes attained by jet-engined airplanes have doubled. Higher "ceilings" have also been reached by "piston" engine aircraft—the big bombers. In the rarefied atmosphere of 40,000 to 60,000 ft. above sea level, much of the equipment doesn't want to work in the same manner that it would at lower altitudes.

Controls must be carefully "tailored" to fit the high altitude conditions. "Arcing" in electrical circuits becomes a big problem as sparks jump like crazy at the lowered atmospheric pressure.

Problems with temperatures at such high altitudes vary with the type of plane. With some "piston" engine models the problem is one of determining the effects of, and means of protection against, the sub-zero temperatures encountered at high altitudes.

With the supersonic speeds achieved by jet-propulsion planes, the problem is one of the high temperatures caused by "aerodynamic heating" of the plane's fuselage caused by high-speed flight. This means that some method of cooling the plane's cockpit had to be found and tested to prevent the occupant from being literally fried by such heat.

2. Problems of temperature and humidity.

Dr. Sharp of the Lewis Laboratory calls the conditioned air supply "the real heart" of our laboratory. By cooling, drying, and exhausting the air it is possible to develop the exact conditions found at the high altitudes. And in a new "supersonic" wind tunnel, air speeds twice the speed of sound can be produced.

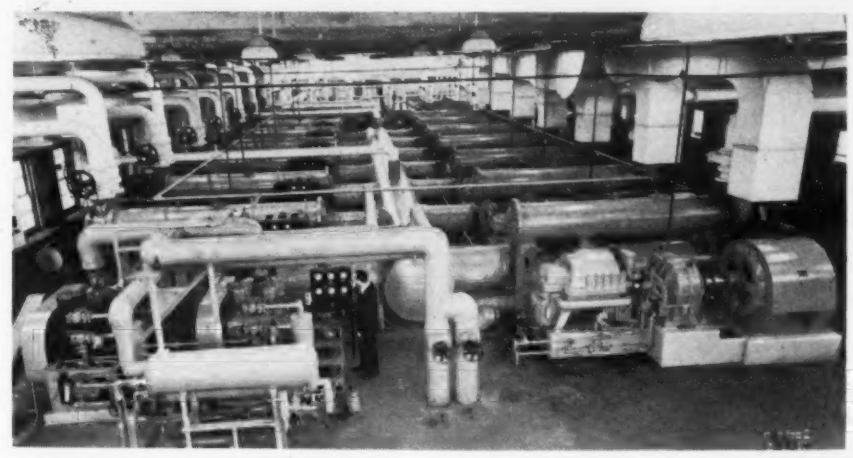
Thus, the effect of the rarefied, extremely cold, dry air can be studied in relation to its effect on the operation of both "piston" type and jet engines.

Separate "rigs" are set up for each test, and in some cases 1,000 readings may be taken on a single engine under test.

In testing jet engines the altitude tunnel permits a "coordinated effect" of pressures and temperatures to be checked. This is important, because at low air pressures the "thrust" effect (which is what drives the jet plane) is lessened, and thus the extent of this factor can be studied in the laboratory.

3. Problems of "icing conditions."

"Icing conditions" occur when a plane passes through atmosphere wherein the temperature and relative humidity are such that ice deposits on the plane surfaces.



To provide the necessary cooling effect for the altitude wind tunnel and other test setups at the Lewis Engineering Laboratory for testing aeronautical equipment, a battery of 14 Carrier 1,500-hp. centrifugal "Freon" compressors provide 21,000 tons of refrigeration capacity which is "scheduled" to the various test cells from one master control room.

Icing conditions result in loss of engine power, loss of wing lift, loss of propeller thrust, loss of visibility, and loss of radio reception.

Tests and observation have shown that the worst icing conditions occur at 20,000 ft. with the temperature at -20° F. and relative humidities such as to develop rapid icing. However, icing conditions occur most frequently, if not so severe, at altitudes of 10,000 ft.

While jet planes are immune from icing problems while flying at supersonic speeds at high altitudes, they are not immune when flying at slower speeds at lower altitudes.

"Icing research" has played a part in the development of de-icing equipment, such as heaters on the leading edge of wing sections, that have largely conquered this problem.

4. Problems of environmental conditions at ground level.

Planes don't spend all of their time in the air. Nor can they be expected always to operate in a temperate climate. Planes that operate from the Arctic Circle, or the deserts of the Near East, or in the humid atmosphere of the sub-tropics, encounter some special problems right on the ground.

Some of the B-29 bombers in the Pacific theater during World War II were so badly corroded from the salt-laden atmosphere that they had to be junked.

Now plane parts get a "pre-testing" in salt-fog test chambers at Wright Field, where most of this type of test work is conducted.

5. Problems of supersonic flight.

There are special problems in flight at supersonic (faster than the speed of sound) speeds. Yet these conditions, too, are simulated in the

(Continued on Page 18, Column 2)

Number 2 of a series of advertisements which dramatize the essentiality of the air conditioning and refrigeration industry.

Appearing in *The Saturday Evening Post, Time, Newsweek, U. S. News & World Report, Business Week, Wall Street Journal, The Christian Science Monitor.*

Air conditioning and production

The fear of war is hanging over our heads. And the free world hopes that America's growing strength will end this threat.

That is the challenge and the opportunity. To meet it, America must produce *faster, better, cheaper.*

Carrier can do something about this. For in World War II — and in the breathing spell that followed — air conditioning proved itself as a production tool.

In airplane engine factories, air conditioning prevented the expansion and contraction of metals — helped make finely tooled parts fit exactly.

In electronics plants, air conditioning assured the microscopic precision required for guided missiles, radar and bombsights.

In drafting rooms, air conditioning increased output — reduced the number of damaged drawings.

The air conditioning of whole plants stepped up production, in both quantity and quality. Men and machines became more efficient.

Today in America vast assembly lines are being brought into operation. And at critical points along these lines, air conditioning will help turn out goods *faster, better, cheaper.* Carrier is at work now on that assignment.

But American industry is something more than great big companies. Thousands of small factories must produce the parts which will feed the final assembly lines.

Many of these will need air conditioning — and quickly. The answer to this problem is Carrier "packaged" air conditioners. They can be obtained on short notice. Their installation is a simple job. Frequently, duct work is not needed.

These units may be installed singly or in groups. Actually, batteries of Carrier Weathermakers are being used right now to air condition a wide variety of production areas, including factory offices.

Air conditioning can help you produce *faster, better, cheaper.* Consult the Carrier dealer in your city. He is listed in the Classified Telephone Directory.

Carrier

AIR CONDITIONING • REFRIGERATION

Display This Flag in Your Store

Coolair TRADE MARK

And Watch YOUR Summer Profits Soar!

With Low-Cost Cooling Folks Will Buy!

The complete line of Coolair Breeze Conditioning units means summer cooling within the financial reach of almost every prospect. There are small window units, single and twin attic package units and home, commercial and industrial units up to 9′ blade diameter—a unit for every cooling job!

THIS SALES PLAN BOOSTS YOUR PROFITS HIGH!

1. Valuable Franchise

You are guaranteed a market area large enough for excellent profit opportunities.

2. Sales Training

When you become an authorized dealer, your personnel will be trained under factory supervision. Your profits start in a hurry!

3. New, Hard-Hitting Advertising and Promotion

Up-to-the-minute Coolair advertising and promotion helps pave the way for profitable sales. Factory even sends direct mail to YOUR prospects!

This unique Coolair proposition for 1951 is a money-maker you can depend on. Don't delay—mail this coupon NOW! No obligations.

AMERICAN COOLAIR CORPORATION
leaders in Air Cooling for 23 Years

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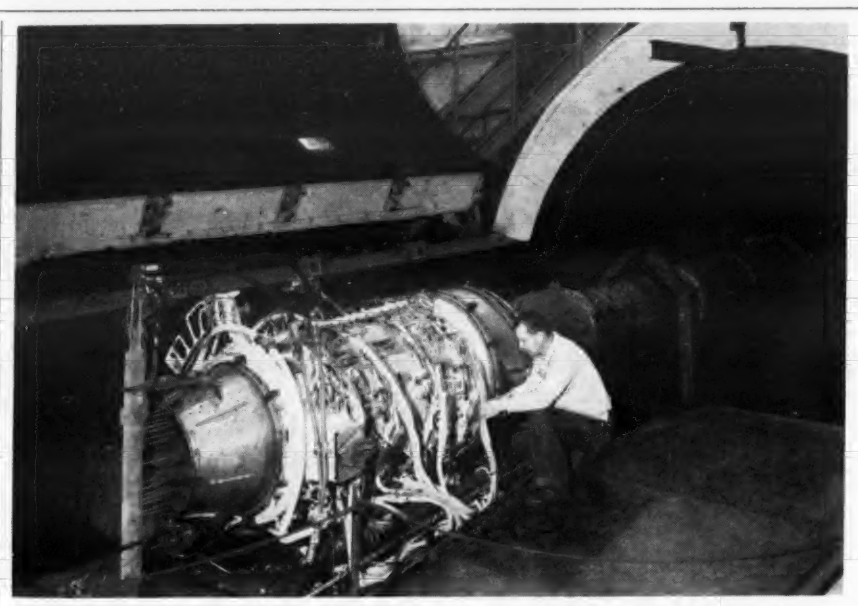


A technician works on the instrumentation of a full-scale turbo-jet engine installed for test runs in the test chamber of the Altitude Wind Tunnel at Lewis Engineering Laboratory in Cleveland. A refrigeration and air drying system, in conjunction with an exhaust system, develop conditions that are the exact counterpart of those encountered in altitudes up to 65,000 ft.

An aircraft component undergoes a test in the Humidity Chamber of the Engineering Division's Environmental Test Facilities at Wright-Patterson Air Force Base. Conditions for the test called for an 80° F. temperature, with 98% relative humidity.

Air Conditioning Aid To Research Work In Aeronautics

(Continued from preceding page)

Lewis Laboratories. For here in the Supersonic Wind Tunnel speeds equivalent to Mach 2 are developed. (Mach 1 is the term used for the speed of sound, which varies by temperature and pressure, at sea level being about 760 m.p.h.).

This supersonic wind tunnel is a sort of Buck Rogerish affair, which probably would have seemed outlandish for even a comic strip not too many years ago. Three giant motors with a total rating of 87,000 hp. move a turbine bigger than a good sized house, which compresses air through seven stages. When the air hits the test rig the effect is the same as though the object was hurtling through the air at twice the speed of sound.

Supersonic Wind Tunnel

Power for this operation is furnished by the Cleveland Electric Illuminating Co.—but the Lewis Laboratory workers don't just turn on this job like they would an electric light switch.

Power is taken at "off peak" periods (late at night) or when "on peak" excess is available (around 2 to 4 p.m.). By arrangement with the utility the power is thus available at a very low rate. Also, if the installation was turned on without any regard for power considerations, it might knock out a fair share of the lights in the Cleveland area.

When the tunnel was first started up, nothing had been done to mitigate the sound and vibration effects, and the resulting racket and vibration effects were said to have shattered glass some miles away and to bring Cleveland citizens running from their homes wondering if the airport were under attack.

No refrigeration is employed in the supersonic tunnel, although the air is dried by passing over huge beds of activated alumina before entering the compressor.

At supersonic speeds and high altitude conditions jet engine characteristics change, the engine does more work and is less efficient, and the lift-drag ratio drops. Also, things happen to the "engine breathing" rate as the intake tends to "regurgitate" and spill out the air at such terrific velocities.

May Cool Jet Engines

There is a factor in jet engines in which refrigeration may come into play. One of the known ways to get more speed in a jet is to increase the temperatures as more heat develops more thrust.

But jet engines now exhaust gases on surfaces which are in the range of 1,500° F. and tail pipe gases are at considerably higher temperatures. This accounts for the need for the use of the scarce materials cobalt and titanium in jet engine parts.

However, if methods could be found for an internal cooling system for parts such as compressor blades, higher heats might be utilized, and less expensive metals could be used in producing jet planes. The facilities for testing equipment that might do this job are available.

The refrigeration installation at the Lewis Laboratory is used to supply great quantities of refrigerated air. This refrigerated air is rationed through a centralized control room which operates in much the same fashion as a dispatcher's office in a power station, or in a railroad switch yard.

A technician inspects two types of icing rate meters attached to an aircraft wing after an icing run in the Lewis Laboratory icing tunnel. Upper device is pressure type, lower is rotating disc type. Tests like this made in the safety of the laboratory have saved lives and property.

It is necessary to "schedule" the refrigerated air to the various test areas, and the "budgeting" of the supply is determined some time before its actual use.

The plan is developed and the main supply controls are operated from the "nerve center" control room, where a system of switch lights indicate what test areas are getting the supply. However, the engineer in control at the particular test area actually directs the cold air into his operation—after it has been budgeted to him.

Air for the altitude wind tunnel is first cooled to 40° F., and is then directed over air dryers which reduce the dewpoint to less than 0° F.

Further cooling is then done over the main bank of "W" shaped coils to bring the air temperature down to as low as -50° F., to simulate conditions of altitudes up to 50,000 ft.

The refrigeration effect is furnished by a battery of 14 centrifugal compressors, each rated at 1,500 hp. A total of 30 tons of "Freon-12" is used in these machines.

The prevention of equipment and material failure resulting from the widely varied climatic and environmental conditions imposed by global operations of the Air Force is the prime objective of the Environmental Test Facilities in the Equipment Laboratory at Wright-Patterson Air Force Base in Dayton.

Within the test chambers provided by the Experimental Test Facilities can be duplicated every known weather condition on the face of the earth and every foreseeable operational flight condition. Thus, the Engineering Division at the base is presently engaged in an intensive program of pre-service-testing Air Force material under conditions to be encountered over greatly separated geographical regions and extremes of flight operation.

Tests for Materials, People

Environmental tests check the reaction of equipment to any given set of conditions in a broad temperature range. Current emphasis is placed on meeting the added temperature stress on materials of very high speed, high altitude aircraft.

Some of the test chambers are of the "reach-in" type for small parts or sections of materials; others are of "walk-in" size taking humans or larger components and complete sections. Following are "thumbnail" descriptions of some of the test chambers:

Low or High Temperature Altitude Cabinet: Provides a temperature range of -112° F. to 250° F., and simulation of altitudes of 156,000 ft.

Humidity Cabinet: With a temperature range of 70 to 165° F., it is suitable for tests involving special conditions, such as 160° F. with 95% relative humidity, and 30-day test periods. Provides 24-hour period cycling or 1-month period without cycling.

Fungus Chamber: With a temperature range of 70 to 120° F., the test facility is set up so that cycling of both temperature and relative humidity is possible. The chamber is used to test the growth of various fungi, and the resultant effect on various types of equipment.

Humidity Chamber: Incorporating an entrance lock, walk-in type test area, suitable for conducting tests on larger items of equipment. Temperature range of 41 to 185° F., with 30 to 100% controlled relative humidity. Cycling conditions permissible, automatically controlled and scheduled by electronic instruments.

Low-Temperature Test Chamber: Providing a temperature range of 80° to -112° F., for long periods of uninterrupted operation.

All Weather Low or High Temperature and Controlled Humidity Chamber: A 10 by 10 by 8-ft. chamber with a temperature range of -112° F. to 160° F. Relative humidity varied from atmospheric to saturation from 40° F. Automatic control of temperatures.

Low-Temperature Altitude Chamber: Providing a temperature range of 40° to -112° F., with altitudes to 55,000 ft.

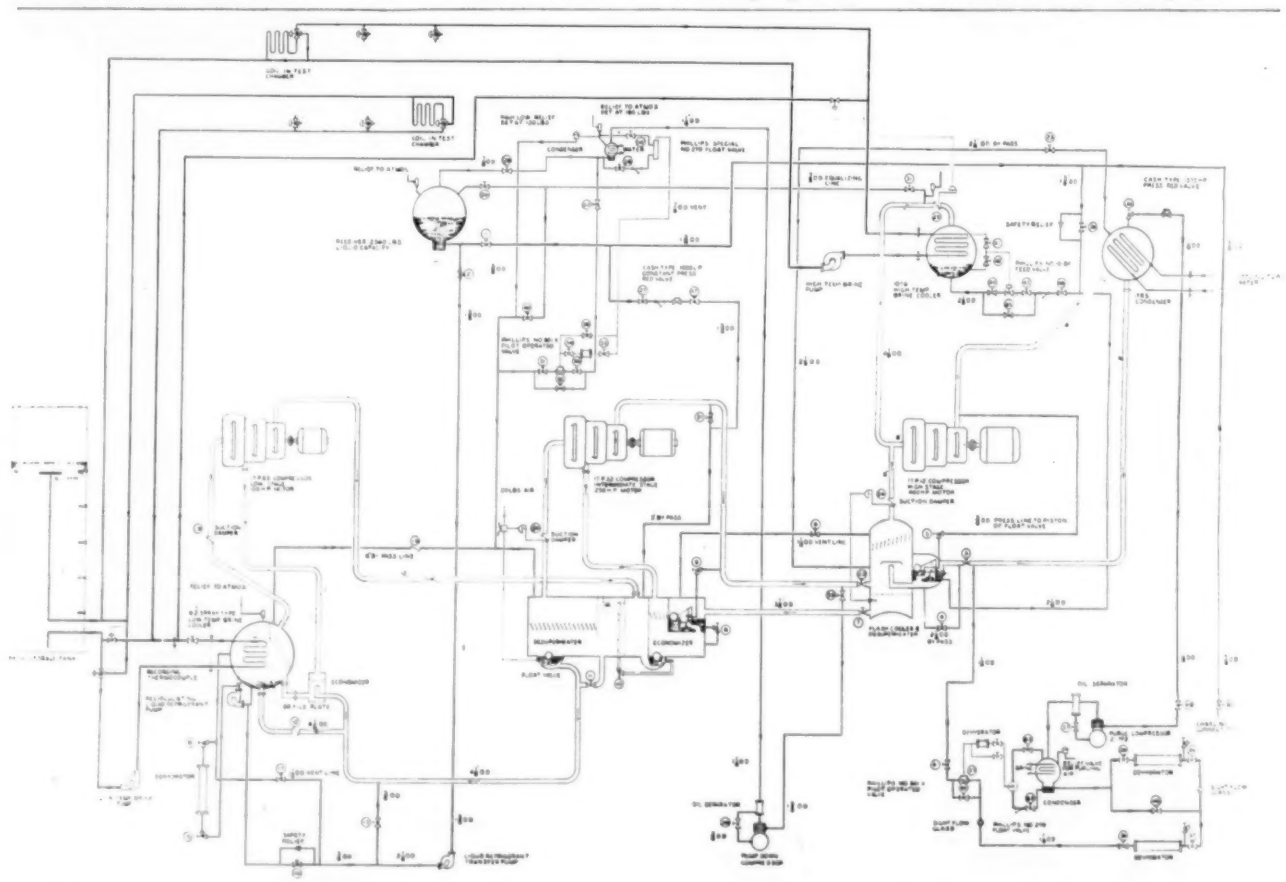
For those chambers in which variable conditions are desired, the laboratory operators cut a metal "cam" which operates through electronic pneumatic control setups to provide the proper conditions. Thermocouples are used for the sensing element.

The low temperature chamber providing temperatures down to -112° F. is controlled off the dry bulb only. Inspection is possible through a section containing eight panes of glass, with seven air spaces.

Cooling surface consists of fin coils, three fins per inch. The system provides 12 air changes per minute.

A courageous soldier tested out an Arctic survival suit for 24 hours in

(Concluded on next page)



Schematic cycle diagram of "Freon-12" and the methylene chloride brine in the system which provides the refrigeration effect at Wright-Patterson Air Force Base. This multistage system is so operated that it has a ready supply of brine at all times to furnish temperatures as low as -100° F. Some new ideas in refrigeration system design were developed in this installation to provide the "continuous" refrigeration effect.

Controlled Air Conditions In Test Cells Speed Development of Better, Safer Planes

(Concluded from preceding page)

one of the chambers held constantly at -55° F. He came through with no ill effects, and even managed to catch some sleep.

Refrigeration effect for these test chambers is accomplished by the Carrier refrigeration system which cools methylene chloride brine to -125° F. for the low temperature chambers, and to 30° F. for the test chambers in that temperature range.

With test schedules such that instantaneous loads are extremely variable and the possibility of simultaneous heavy loads from several chambers, a system of ample capacity was installed. The large brine storage tank has a capacity of 30,000 gals. to "float" on the load.

Controls are so arranged that the storage tank can carry the entire load (both for low temperature and high temperature circuits), can assist in meeting the load, or can be recharged while the refrigeration plant is meeting the chamber load demand.

The refrigeration plant is direct staged, using "Freon-12" as a refrigerant and employing three centrifugal compressors (as shown in the drawing). The high stage compressor is driven by a 400-hp. motor, intermediate stage by a 250-hp. motor, and low stage by 150-hp. motor, all through speed increasing gears.

All of the motors are variable speed, capable of remote and speed selection down to 75% of full speed. Capacity control is through the speed reduction of the compressors.

The three stages of compression allow interstage flashing of liquid refrigerant in three stages. In addition, interwheel flashing is employed on both intermediate and low stage, the flashed gas being compressed through two of the three wheels on each of these stages.

A Ready Supply of Cooling

When the demands of temperature level are such that the low stage can be shut down, the low temperature brine continues to be cooled in the low temperature cooler (but at a higher temperature level) and the suction gas is drawn through the idle low stage compressor. The valve in the hot gas by-pass line around the compressor is then opened to reverse flow as a parallel suction line to reduce friction loss.

Between stages, desuperheaters are used to cool the hot compressed gas from the preceding stage.

The intermediate-high stage desuperheater is designed as a vertical shell wherein the flashed liquid is directed against a splash plate and the hot gas is directed through the resultant spray.

A "bubble" on the side of this vessel houses the first high side float valve which is of somewhat unusual design in that it is powered by hot gas at condenser pressure acting on a floating piston which is positioned by a float actuated valve ported in the piston head.

A hand set restrictor valve in the power pilot line allows the piston ported float to modulate the pressure on the piston head so that the valve modulates nicely even when the liquid flow direction opposes the closing valve.

The low-intermediate desuperheater is built into a horizontal shell directly attached to the intermediate stage compressor suction. This vessel also houses the interwheel economizer and three high stage float valves through which the liquid flows in series.

The first flashes liquid from high stage suction to intermediate stage interwheel, the second to intermediate stage suction, and the third to low stage interwheel. Desuperheating in this vessel is done by means of nozzles spraying liquid through which the low stage discharge gas is directed. Both desuperheaters employ eliminator plates to assure reasonably dry gas to the suction of the succeeding stage.

The low stage economizer does not use a float valve. By this time the density ratio of liquid to gas is so high that a suitably sized simple orifice is practical to maintain an effective liquid seal.

Low temperature brine cooler is of the spray deck type using recirculated liquid refrigerant pumped over a perforated spray deck. The resultant flash type evaporator eliminates submergence loss which can be serious since 6 in. of liquid head at -125° F. corresponds to a difference in evaporator temperature of 27° F.

The purge and recovery systems used on this installation follows the principles of a type of purge and recovery system used on centrifugal machines employing "Freon-11" for water cooling. In this type system, the foul gases are removed from the main condenser at a point where they are concentrated by means of baffles in the high pressure gas stream; the mixture is then compressed and delivered to an auxiliary condenser where as much of the "Freon" (and water vapor) is condensed as the available condensing medium permits. The compressed air is blown to atmosphere through a relief valve, and the condensed water vapor is separated by weir before the recovered liquid "Freon" is returned to the system.

How System Is Controlled

Thermal controls for the brine circuits and capacity controls for the compressors are relatively simple. Taking the basic assumption that the brine in the lower portion of the storage tank is colder than need be for any specific chamber requirement, a three-way and a two-way valve positioned pneumatically by an electronic controller so that the storage tank floats on the load like a battery.

A series of thermocouples at different elevations within the tank allows ready determination of the charge at any time.

If the plant capacity is inadequate (brine temperature leaving the low temperature cooler too high), the three-way valve is positioned to draw some brine from the lower tank connection, a like amount of warmer brine returning via the upper.

On the other hand, if the temperature leaving the cooler is too low, the three-way valve shifts to draw warm brine from the top of the storage tank and the two-way valve opens to allow a like amount of colder brine to return to the bottom of the tank. This latter is the condition existing when the tank is being recharged. Both valves are controlled in sequence by the same thermostat which senses the temperature of the cold brine leaving the low temperature cooler by means of a thermocouple.

The high temperature brine cooler is controlled by a butterfly type back pressure valve located in the cooler suction. In sequence with this valve, and controlled by the same instrument, is another two-way pneumatically positioned valve in a cross-connecting line between the low and high temperature brine circuits.

Thus, when the brine temperature leaving the high temperature cooler is too high, the lower temperature circuit helps out. The low temperature brine borrowed is then returned at an expedient point in the circuit.

Both low and high temperature circuits are at all times freely connected to the storage tank, which also acts as a balance tank to absorb the changes in brine volume due to thermal expansion. The tank is pressurized by means of oil-pumped nitrogen to a degree precenting boiling at any point in both circuits.

The drives on all three stages are variable speed, manually selected. Generally, during operation, capacity is not retarded to balance load; instead the excess is used to charge the storage tank, and when fully charged, the refrigeration plant is shut down until the tank charge is again depleted.

In the low temperature chamber at the Wright-Patterson Environmental Test Facilities, instruments are checked at temperatures down to -60° F. and lower, which reaction is noted on the indicator outside.

Number 3 of a series of advertisements which dramatize the essentiality of the air conditioning and refrigeration industry.

Appearing in *The Saturday Evening Post, Time, Newsweek, U. S. News & World Report, Business Week, Wall Street Journal, The Christian Science Monitor.*

Air conditioning and manpower

Five years ago, we began to disarm. But the other fellow didn't. So now our side has some catching up to do.

This is going to take a lot of manpower. Manpower in uniform. Manpower in factories. Manpower everywhere.

It all adds up to harder work and longer hours. And especially for some of us.

Men in drafting rooms, for instance. And researchers, engineers, toolmakers, pattern builders and others like them. To say nothing of the managers who blaze the trail of mass production.

Air conditioning can help these men turn out more work more quickly. And it's the same air conditioning that helps make goods faster, better, cheaper.

At the outset of World War II, Carrier air conditioned a large drafting room. The result was that each draftsman turned out half again as much work. In effect, two men became three.

In another case, the air conditioning of a shop making finely-machined tools resulted in an 8% increase in production efficiency. Absenteeism dropped. And so did labor turnover.

Frequently, it's difficult to measure the benefits of air conditioning in exact percentages. But it is beyond argument that a man can do a better job when he is cool and calm instead of hot and bothered.

For example, we know from actual experience that in offices where heat would be oppressive, Carrier Room Air Conditioners help keep minds clear and contribute to wise management decisions.

We know also that in homes, these window units enable men and women to sleep through sultry nights and be better prepared for the day ahead.

From packaged air conditioning, easily installed, to large systems for whole plants and office buildings, Carrier puts into the hands of management a means of multiplying manpower.

Carrier

AIR CONDITIONING · REFRIGERATION

They'll Do It Every Time . . . . By Jimmy Hatlo

THIS CHART WILL SHOW YOU WE HAD A GOOD, HEALTHY FIRST QUARTER, CHIEF! Y'SEE···THERE'S A 3% CORRELATION BETWEEN OUR SALES, THE NATIONAL INCOME AND THE FLUCTUATION OF THE LIRA··· NOW WITH OUR 6% COEFFICIENT FOR OPTIMISM, PLUS 50% MORE OPEN FRONT DOORS IN THE SUMMER···WE'LL ARRIVE AT A SALES PEAK OF···
SOME HEALTHY FIRST QUARTER! EVEN THE RED INK HAD TO GET TRANSFUSIONS···
LOOPHOLE OUGHTA MAKE A CHART OF BOSSO'S BLOOD PRESSURE IN CORRELATION TO THE SPREAD OF APPLESAUCE··
ANOTHER MONTH LIKE THE LAST ONE, AND GOOD OL' LOOP WILL BE DESIGNING ROLLER-COASTERS····
O.K! CUT THE BALONEY! ALL I WANNA KNOW IS HOW MUCH WE LOST!
AS COMPARED WITH SALES OF FULTON STEAMBOAT STOCK IN 1808
1ST QUARTER 1951 AS COMPARED WITH LUNAR ECLIPSE 1898
JAN. FEB. MAR.
OUR SHARE OF THE NATIONAL PIE
SALES MANAGER
JIMMY HATLO
WATCHING THE CAMOUFLAGE EXPERT TRY TO DO HIS ACT···
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"I have always felt that whatever the Divine Providence permitted to occur I was not too proud to report. The people are not served by pussyfooting, or by that sort of journalism in which nobody will ask who is the editor of a paper or the writer of an article, and nobody will care."—*Charles A. Dana.*

Air Conditioning Is A Secret Weapon

ONE thing Joe Stalin doesn't have in his arsenal is an air conditioning industry. Chances are he still thinks it is a luxury—a method of pampering people who are uncomfortable in hot weather.

The truth is that comfort cooling accounts for only a relatively small portion of the American air conditioning industry's output. Bulk of the installations are made in factories, industrial processing units, and places of business.

As a matter of fact, air conditioning was invented to solve temperature-and-humidity problems in manufacturing establishments. Quietly, it has continued to progress in that direction. Unfortunately (for Joe Stalin) the publicity accorded air conditioning has centered on the comfort theme. Few people anywhere realize that primarily it is an *industrial tool* of great magnitude.

Such is the power of publicity – and the ease of ignorance – that air conditioning can be counted as an important "secret weapon" in the Arsenal of Democracy. No attempt has been made to keep it secret, but it might as well have been "classified" in terms of actual results. By happenstance, America has the only air conditioning industry in the world. The Soviet knows plenty about atomic energy, which was "classified," but there is little evidence that Stalin's engineers have even looked into the possibilities of air conditioning, which:

(1) Saves precious metals by reducing waste.

(2) Permits substitution of synthetics for scarce materials by making these synthetics possible.

(3) Multiplies manpower by enabling fewer men to produce more weapons.

All analysts agree that the only edge Russia has on us is extra manpower. Air conditioning reduces the need for additional manpower in defense industries, and thus helps blunt this "edge." In that connection we can't improve on these sentences (written by Carrier and N. W. Ayer in collaboration):

"Five years ago, we began to disarm. But the other fellow didn't. So now our side has some catching up to do. This is going to take a lot of manpower. Manpower in uniform. Manpower in factories. Manpower everywhere. . . . Men in drafting rooms, for instance. And researchers, engineers, toolmakers, pattern builders, and others like them. To say nothing of the managers who blaze the trail of mass production. Air conditioning can help these men turn out more work quickly. And it's the same air conditioning that helps make goods faster, better, cheaper. In (one) case, the air conditioning of a shop making finely machined tools resulted in an 8% increase in production efficiency. Absenteeism dropped. And so did labor turnover. Frequently, it's difficult to measure the benefits of air conditioning in exact percentages. But it is beyond argument that a man can do better work when he is cool and calm instead of hot and bothered. In scores of factories that are fashioning metals into aircraft engines, guided missiles, and radar, air conditioning helps to insure microscopic precision, cuts down rejects, and reduces scrap. It contributes to mass production in textile mills, in the making of plastics, the production of synthetic rubber, high-octane gasoline, chlorine, and other chemicals. In the manufacture of many products it is essential: films, gauges, detonators, bombsights, range finders, rockets, safety glass, penicillin, and streptomycin."

Joe Stalin's spies missed the boat when they overlooked the importance of air conditioning.

Do You Have 'Both Feet On The Ground'?

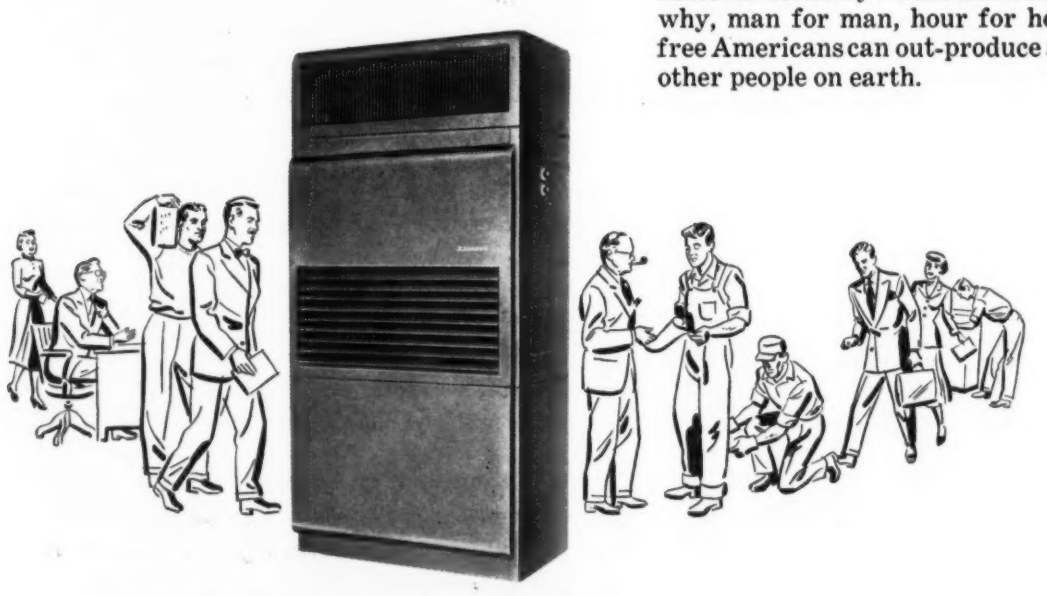
HOW AIR CONDITIONING
multiplies
AMERICA'S
MANPOWER

In our defense program, production is the pay-off... and air conditioning is giving us the equivalent of millions of extra man-hours every year. Wherever it goes into action, the efficiency curve goes up, as the temperature goes down. Here's what time study engineers find...

Employees work better, faster ... more accuracy, less waste.

Absenteeism dives to new low figures, thereby stretching our manpower resources for maximum productivity.

American efficiency gets a lift from air conditioning – not only in the offices and plants where people work ... but in the stores where they shop, in the restaurants where they eat, in hotels and hospitals... wherever they encounter it in their daily lives. Air conditioning pays its own way—in morale, in output, in physical welfare. It is part and parcel of our national economy... another reason why, man for man, hour for hour, free Americans can out-produce any other people on earth.



TYPHOON is proud of the part its dealers are playing in equipping American business and industry with the finest in packaged air conditioning – at the lowest dollar cost per ton. Today Typhoon packaged units are widely used in offices, factories and laboratories of defense contractors large and small, because they are –

- quick and easy to install
- cheaper to buy — and to operate
- flexible — can be used singly or in multiple installations that provide zone control economy.

TYPHOON Air Conditioning Co., Inc.
America's No. 1 specialists in packaged air conditioning
794 UNION STREET, BROOKLYN 15, N. Y.

Experiment In Sheep Breeding

University of Kentucky Finds Air Conditioning Aids In Producing High Quality Lambs for Early Spring Market

LEXINGTON, Ky.—Now they're using air conditioning to control the love life of sheep!

It's being done at the University of Kentucky Experimental Station Farm here where some of the world's finest sheep are raised.

The air conditioning system was installed by the J. Ralph Smith Co., Inc., local commercial refrigeration and air conditioning firm.

A description of the system written by J. Ralph Smith, president of the company, won the $50 second prize in the central system division of the "most unusual air conditioning application" contest sponsored by AIR CONDITIONING & REFRIGERATION NEWS.

The system was ordered because officials of the Experimental Station think there is a definite relationship between air temperature and the price of lambs.

Temperature Affects Breeding of Sheep

They say, Smith explained, that temperature conditions affect the breeding of sheep. A temperature of around 50° F. apparently is most conducive to stimulation of mating activities. Thus, breeding takes place in June or July and the resulting lambs are not born until January or February of the following year. This means that the lambs are not ready for the market until April or May.

Since the first lambs on the market bring the highest prices, Station experts are trying to find the conditions necessary to control the love life of sheep so lambs can be marketed earlier. And that's the reason Smith was asked to install the air conditioning system.

Smith confessed that he didn't know much about sheep "except that their wool, made into long underwear, makes me itch, and I don't like mutton." However, he agreed to tackle the job.

The system was installed in a Station sheep barn which contains several breeding pens.

"We took a section of the barn 25 ft. by 20 ft. and with a 9-ft. ceiling and insulated the walls, ceiling, and floor with 4 in. of corkboard," Smith related.

Triple Glass Windows

"The walls were plastered with Portland Cement plaster and a 3-in. concrete floor was laid. We installed a 3 by 6 cooler door with an inspection glass and triple glass windows in each side of the room.

"In the room we installed a Carrier 15Q2 Weathermaker, to which we connected a duct running across the room, with a slot on each side for distribution of 4,150 c.f.m. with no drafts.

"In this Weathermaker, below the coil, we installed a 1-in. water line with six mist heads in it and a modulating water valve. Above the coil we installed a water defrosting spray which is controlled by hand. Above this spray we installed a bank of five 2,000-watt strip heaters.

"We installed an outside air duct in which there is a motor-driven damper. This damper is controlled by a switch on which are numbers to indicate the amount of outside air that will be induced by any particular setting of the switch.

"In the opposite wall we installed a 12 by 12 relief damper. In the machine room, adjacent to the barn, we installed a 5H40 Carrier compressor and a 9Q2 Carrier evaporative condenser and receiver."

The sheep room, Smith went on, was provided with a control panel board on which were placed the controls and a recording thermometer and hygrometer. Conditions maintained, as specified by the university, are as follows:

Variable Specifications

With a minimum of five sheep and a maximum of 25, regardless of outside conditions, a variable temperature of from 40° F. to 100° F., with a variation of plus or minus 1½°; outside air from 40 c.f.m. to 200 c.f.m.; humidity control from 60 to 85%.

Smith said these conditions are maintained by a set of Minneapolis-Honeywell controls. Describing the control layout, he stated:

"We have a humidistat and thermostat in parallel connected to the magnetic starter of the compressor and to the load side of the fan starter, a duct-type thermostat in the supply duct connected to a five step controller. Each step of the controller is connected to one of the strip heaters.

"We have a humidistat connected to the modulating water valve and to the fan starter. The operation is as follows:

"Assume the controls are set for a temperature of 40° F. and 80% humidity.

The system is then started, the designed temperature is reached, but the cooling coil has pulled the humidity down to 70%. The humidistat controlling the water valve goes into operation and adds moisture through the mist heads, until the humidistat is satisfied. Then design conditions are met.

"However, assume the maximum amount of outside air is being induced and the room has a 25-sheep load. The desired temperature is reached but the humidity is too high.

Automatic Operation Holds Pre-Set Conditions

"The humidistat controlling the compressor takes over and starts the compressor to dehumidify the air with the cooling coil. This, of course, lowers the temperature below the desired point. In this instance the thermostat controlling the step controller takes over and cuts in the strip heaters until the temperature is back up to design.

"Assume the outside temperature is 0° F. and inside design temperature is 80° F. Then only the thermostat controlling the step control takes over and the strip heaters become activated as desired."

Smith reported that the compressor has four stages of capacity reduction, built in, and when dehumidifying only is required, the capacity stages operate by the suction pressure.

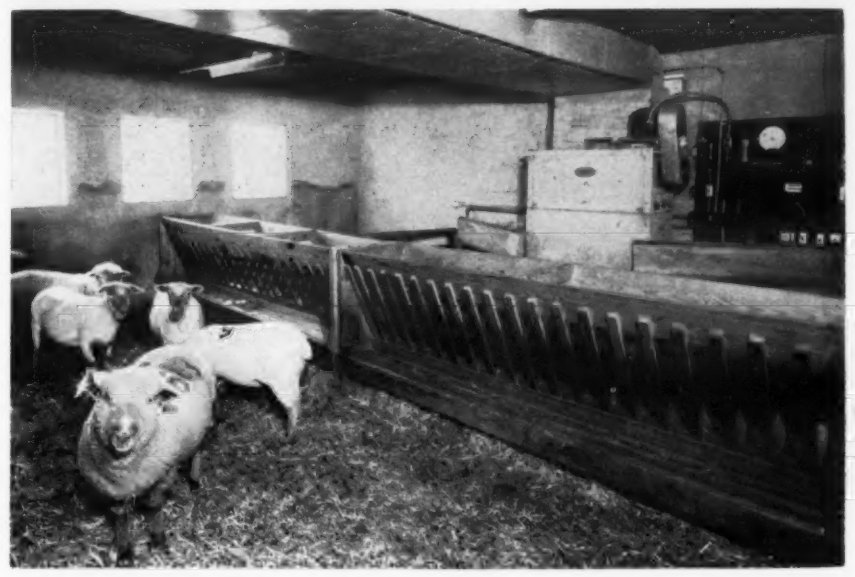
The water defrost spray, he noted, was installed as a precaution in case the Weathermaker was operated over a period of weeks at a 40° temperature and the coil became iced up.

"The compressor and fan could be shut down and the spray turned on for a period of about 10 minutes, which would knock the ice off without disturbing the temperature or humidity too much," Smith further stated.

"The evaporative condenser was sized large enough to operate dry when the outside air reaches a temperature of 32° F.

When this temperature is reached, a thermostat in the machine room closes a water solenoid valve feeding the condenser, opens a water solenoid valve in the drain and cuts in an electric heater in the machine room to keep the water lines from freezing."

All this, Smith concludes, "to control the love life of a sheep."



TO HELP KEEP SHEEP HAPPY in the breeding pens at the Experiment Station Farm, University of Kentucky, a Carrier Weathermaker was installed to control temperature and humidity. Duct with slots on each side runs across the room and distributes 4,150 c.f.m. of carefully controlled air with no drafts. Panel has controls in addition to recording thermometer and hygrometer.

Number 4 of a series of advertisements which dramatize the essentiality of the air conditioning and refrigeration industry.

Appearing in *The Saturday Evening Post, Time, Newsweek, U. S. News & World Report, Business Week, Wall Street Journal, The Christian Science Monitor.*

Faster, better, cheaper

Both today and over the long pull, we've got a double job to do.

America is rearming at a multi-billion dollar pace. For peace, we hope. For total war, if that must come.

But the real trick — the other half of the double job — is to do this and still maintain a civilian economy that is strong and virile enough to sustain our military might.

To produce both "guns and butter," materials must go farther and waste be avoided. Machines must operate at higher speeds, with greater precision. And manpower must be more effective.

In short, goods must be turned out *faster, better, cheaper.* And this is the very job for which the first air conditioning system was installed half a century ago.

Since then — in times of war and periods of troubled peace between — air conditioning has contributed greatly to the amazing rise in our national productivity.

In scores of factories that are fashioning metals into aircraft engines, guided missiles and radar, air conditioning helps to insure microscopic precision, cuts down rejects and reduces scrap.

It contributes to mass production in textile mills, in the making of plastics, the production of synthetic rubber, high-octane gasoline, chlorine and other chemicals.

In the manufacture of many products it is essential: films, gauges, detonators, bombsights, range finders, rockets, safety glass, penicillin and streptomycin.

And there simply is no question but that men and women, free of depressing heat and humidity, can produce more with less fatigue — whether they work in offices or in overalls.

Because air conditioning is a production tool, virtually every Carrier product has been recognized with a DO or Defense Order rating. These high-priority letters have been assigned to orders ranging from huge Centrifugal Refrigerating Machines for industrial processing to packaged Weathermakers for machine shops and drafting rooms and Room Air Conditioners for military and government offices.

On top of this, Carrier products continue to be sold in volume for a wide variety of commercial purposes. The objective is to get things done *faster, better, cheaper.* And the result is a stronger civilian economy.

We are proud that in this National Emergency, the products of the air conditioning industry are playing a major role in the double job that faces all Americans.

Carrier

AIR CONDITIONING • REFRIGERATION

NOW! Help your customers

SPEED PRODUCTION •

with Remington

"ON-THE-SPOT"

AIR CONDITIONING

SAVES MONEY EVERY WAY . . .

CHEAPER TO BUY—Remington "On-the-Spot" units cost only a fraction of the initial price of a central air conditioning system. And individual or multiple units can be installed *exactly where needed* without expensive engineering, construction and material costs.

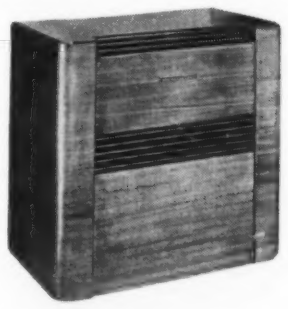
CHEAPER TO INSTALL—Remington packaged units are quick, simple, inexpensive to install. Merely connect cabinet to outside air source and plug into electric outlet. All models can be supplied to fit special voltage requirements.

CHEAPER TO USE—Turn it on or off, day or night, when needed . . . *where* needed. Remington gives you *localized* air conditioning, without expensive operation of a central system.

CHEAPER TO MAINTAIN—If a Remington "On-the-Spot" unit is damaged it can be quickly replaced. Each unit is self-operating, whereas failure of a central type system causes complete breakdown. Easily portable, Remington air conditioning units can be easily moved where needed. Cabinets are interchangeable.

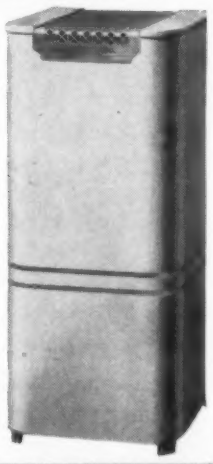
MODELS FOR EVERY NEED . . .

Used either singly or in combination



DIRECTOR and OVERTON AIR CONDITIONERS

LEFT: The most powerful room air conditioners available. Essential for larger rooms or unusually severe conditions. Beautiful mahogany or blond finish, if desired, to harmonize with modern interiors.



MOISTURE MAGNET DEHUMIDIFIER

RIGHT: Prevents costly mildew, mould, rust and rot—protects health—by removing excess moisture from air. Protects valuable property, tools, materials. Invaluable in small shops, libraries, storage rooms, laboratories, etc.

CLIMATE CONTROLLERS

LEFT: Cool comfort in summer, year-round air conditioning benefits. Designed to ventilate, clean and circulate air, eliminate outside noise, heat, cool, and dehumidify. Recommended for laboratories, plant hospitals, shops, blue print and tool rooms—wherever temperature and humidity control is essential.

SPECIAL AIR FORCE UNIT

RIGHT: Speeds training and advancement of students by providing air conditions necessary for maximum alertness and efficiency in confined quarters. Permits instructor and facilities to handle more students per day. Completely self-contained; easily installed and serviced.

PERSONAL AIR CONDITIONERS

ABOVE: For offices and rooms. Instantly adjustable to required conditions. Readily movable. Easily installed at any double-hung window; no plumbing or drain connection necessary.

N • IMPROVE MORALE • CUT COSTS

For INDUSTRY

The job gets done better . . . faster . . . cheaper . . . with air conditioning. It keeps efficiency and quality *up*. Clean, cool, fresh air protects employee health and improves morale . . . cuts down costly absenteeism and turnover . . . increases production per man hour. Quickly installed, and completely portable, Remington "On-the-Spot" units provide efficient, economical air control *where* needed . . . *when* needed.

Temperature and humidity control are essential to protect metals, fabrics, chemicals . . . to insure laboratory accuracy . . . to keep rejects at a minimum . . . to protect fine machined parts from corrosion and grit. Remington units cost less, provide the *exact* protection required . . . and save money on purchase, installation, daily use and maintenance.

TYPICAL INDUSTRIAL USES OF REMINGTON "ON-THE-SPOT" AIR CONDITIONERS

PLANT HOSPITALS
RECEPTION ROOMS
LABORATORIES
PRINTING
STORAGE
METAL WORKING
AIRCRAFT
ELECTRICAL
COMMUNICATION
PHARMACEUTICAL
CHEMICAL
PLASTIC
TEXTILE
OPTICAL
ATOMIC FISSION
DRAFTING
BROADCASTING, TV
AUTOMOTIVE
PHOTOGRAPHY
MARINE

For ARMED FORCES

For mobile or stationary service . . . on land or at sea . . . Remington "On-the-Spot" units solve military problems of air cooling, air drying, liquid cooling, air conditioning and refrigeration. Self-contained or "package" units, in sizes ⅛ HP to 5 HP, or larger. Voltages and finishes to meet all requirements. Marine units are supplied with special salt-resistant cupro-nickel fittings.

To fill special needs, Remington 3-Part Service offers Engineering Consultation, Development and Manufacture. Bring your customers' air conditioning or dehumidification problems to Remington—specialists in portable, "On-the-Spot" units.

TYPICAL MILITARY USES OF REMINGTON "ON-THE-SPOT" AIR CONDITIONERS

AIRCRAFT
PARACHUTE DRYING
RADAR ROOMS
FILM STORAGE
CARGO
SHIP QUARTERS
SICK BAYS
FIELD HOSPITALS
OPERATING ROOMS
HYGROSCOPIC CHEMICALS
RADIO-ACTIVE MATERIALS LABORATORIES
DUSTPROOF ROOMS
PRECISION ASSEMBLY
BLACKOUT ROOMS
CHART ROOMS
BLOOD STORAGE
ORDNANCE STORAGE
CONTROL TOWERS
CLIMATE ROOMS

FREE HELPFUL LITERATURE . . . Let Remington help you get *your share* of today's essential industrial and military air conditioning installations.

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Remington

AUBURN NEW YORK

PLANT HOSPITALS

INSPECTION

STORAGE ROOMS

CHART ROOMS

CONFERENCE ROOMS

RESEARCH

INFORMATIVE BOOKLETS

on industrial and military applications of "On-the-Spot" units . . . available promptly on request to Remington.

One System Cools Spectrometer Room, Network Calculator at Texas A & M

HOUSTON — Providing air conditioning off the same system for both the mass spectrometer room and the alternating current network calculator at Texas A & M college proved an unusual though not impossible problem for Way Engineering Co., contracting firm here.

"As you know, the mass spectrometer is a very delicate instrument, and a relative humidity of 48% is the maximum that can be allowed for its operation," explains W. J. Way II.

"The network calculator is a device on which can be imposed electrical loads simulating power company transmission throughout the state. Since all of the power companies in Texas are interconnected, sometimes one company is buying electricity from another and vice-versa."

By simulating the loads, the network calculator permits problems to be worked out in a few hours that would otherwise take days to solve.

"With these heavy electrical loads being thrown on the calculator at undeterminable intervals, we found that when they were on, a great amount of reheat was provided by this load. The reheat, in turn, was sensed back at the central return air, where the humidistat and thermostat were located.

"This, however, was not a true condition for the mass spectrometer room, so we accordingly added some electric strip heaters to provide reheat for that room."

Compressor used on this installation was a 15-hp. Chrysler Airtemp, which powered a Marlo factory-built conditioner.

This was a direct expansion system, and plant steam was available for heating and reheat in the main conditioner.

An atmospheric cooling tower was installed on the roof of the building to conserve condenser water.

The network calculator served by the air conditioning system is owned by the Texas A & M Research Foundation and was purchased from Westinghouse Electric Corp. from funds provided by the college, Texas utilities, and Westinghouse.

Fahnestock Co. Sold; New Heating Co. Organized

WICHITA, Kans.—The Fahnestock Co., Inc., air conditioning concern at 1600 E. Douglas, has been sold, according to Edward G. Fahnestock, Sr., owner.

At the same time, he announced organization of Temperature Product Co., Inc., which will deal in all types of furnaces and warm air heating and air conditioning systems, doing its own sheet metal work.

Fahnestock has been in the air conditioning business for more than 20 years, starting with his father at St. Paul, Minn., and coming to Wichita during 1938 to open a business.

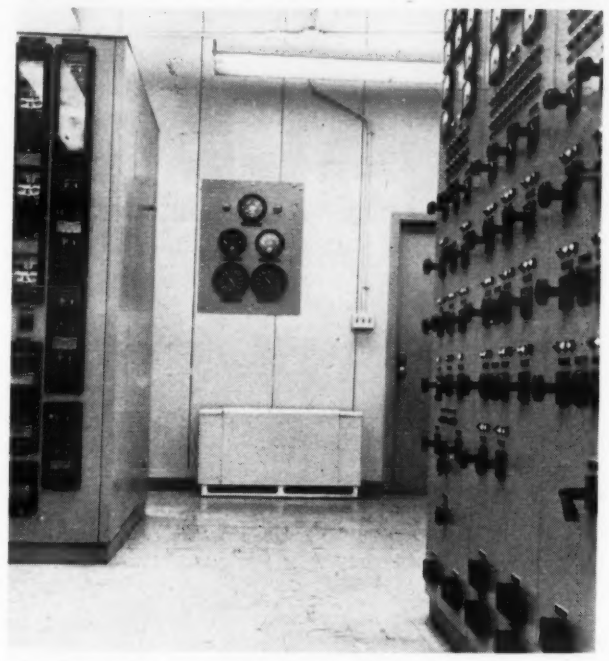
Calumet & Hecla Shows Near Record Gain; Gov't Orders Aid Net Increase

BOSTON—Sales of the Calumet and Hecla Consolidated Copper Co. for the first quarter of 1951 were about 37% higher than the first quarter of 1950 and almost equal to the record sales of the fourth quarter of 1950, E. R. Lovell, president, reports.

Of particular importance in achieving the high level of sales were the defense production orders of the company's Wolverine Tube Division and the sales of zinc concentrates from the company's new Wisconsin mine. These factors compensated for the effect of Government restrictions on production for civilian use. In the first quarter of 1950, lower taxes plus a capital gain on the sale of timber and timberlands accounted for a higher net earning after taxes.

"Securing adequate supplies of copper is a major problem facing the industry," Lovell said. "Unlike the situation in many other fields, inventories of copper and copper products are at an all-time low. Many months of production in excess of consumption would be required to restore inventories of refineries, fabricators, and jobbers to normal levels. However, to date there has been no reduction in demand for copper and copper products, and none is anticipated."

About 25% of the Calumet Division's copper production is scheduled for U. S. Navy requirements in the form of copper oxide, for ultimate use in the manufacture of protective coating for ship bottoms.



CONTROL ROOM of Manila Electric Co. where special dry air is required to keep switches running smoothly.

Power Plant Cooling

Manila Electric Co. Job Calls for No Short-Cycling, But Load Reductions May Go as High as 70%

MANILA, P. I.—Here was the unusual situation confronting Gregorio Araneta, Inc., local Frigidaire distributor, when it went to work on a central air conditioning system for the Rockwell Station 50,000 KVA power plant of the Manila Electric Co.:

On one hand, specifications of Manila Electric called for avoidance of short-cycling. On the other, load reductions up to 70% might occur due to the thermostatic cut-out of units and to the fact that three of the five rooms to be air conditioned are not in operation during the night.

In relating how this problem was solved, Alex W. Baer, manager and refrigeration engineer of the distributor's Frigidaire Department, explained that the installation, as completed, includes one Frigidaire condensing unit, model CEK-1500T balanced with one Frigidaire evaporative condenser, model ECK-20, which produces a capacity of 18 tons at outside wet bulb temperature of 80° F. and 123 lbs. condensing pressure.

"Although the heat load survey at peak hours showed top requirements of only 10.7 tons, the bigger condensing unit was selected in order to have capacity available for further extension," Baer pointed out.

The five room are conditioned, he said, by the use of 10 Frigidaire remote air conditioners, model AC-100R, which are distributed in the rooms according to the load requirements. The "Freon-12" lines have to overcome a distance of 173 ft. in one direction and 140 ft. in the other.

"The installation is intended to take care of comfort conditions in all the rooms and keep the control room supplied with special dry air in order to safeguard the smooth operation of the many electric switches," Baer stated.

"All rooms have their own thermostat to enable the occupants to select the temperature they like best. All air conditioners are equipped with thermostatic expansion valves and solenoid valves."

Baer then described how the above-noted problem was handled:

"We decided to install into the suction lines near the condensing unit three Frigidaire suction pressure regulating valves, model ERV-25, which maintain the desired suction pressure in the coils automatically.

"As these valves throttle the gas the condensing unit operates at a suction pressure, according to the load requirements. As the load might be reduced up to 70%, the suction pressure will be reduced in proportion.

"In spite of this large load reduction the low pressure cut-out switch, the setting of which is 10 lbs., never cuts off the operation of the condensing unit and the condition of the specifications to avoid short-cycling was successfully met.

"This was possible on account of a very close survey analysis which convinced us that the suction pressure between the ERV valves and the compressor will never fall below 15 lbs. Consequently, capacity by-pass control for the condensing unit was not necessary and not installed."

Peruvian Trading Corp. To Represent UsAirco

MINNEAPOLIS — United States Air Conditioning Corp. has appointed the Peruvian Trading Corp., of Lima, as a distributor of its equipment in Peru and Ecuador, it was announced by R. A. Villacres, export manager.

The Peruvian firm, headed by John S. Woodhouse, was formed in 1931 and represents a number of foreign manufacturers of industrial and agricultural equipment.

According to Woodhouse a virtually unlimited market for air conditioning equipment exists in Peru, where there are less than a half-dozen major installations at present. Only a few theaters are air conditioned, and even blowers for theater ventilation are rare, in spite of the equatorial climate.

Peruvian Trading Corp. recently engaged the services of Herman Watzinger, air conditioning engineer in Peru.

Monsanto Product Combats Slime In Cooling Systems

ST. LOUIS—To combat slime formation and micro-biological life in cooling water for some types of air conditioning installations, the Monsanto Chemical Co. here has introduced a new agent called "Santophen 45."

Santophen 45 comes in the form of small brown flakes that can be added to the water at any point. These flakes, used alone or with chlorine or other chemical agents, readily dissolve in the water. The compound is said to work particularly well in acid water.

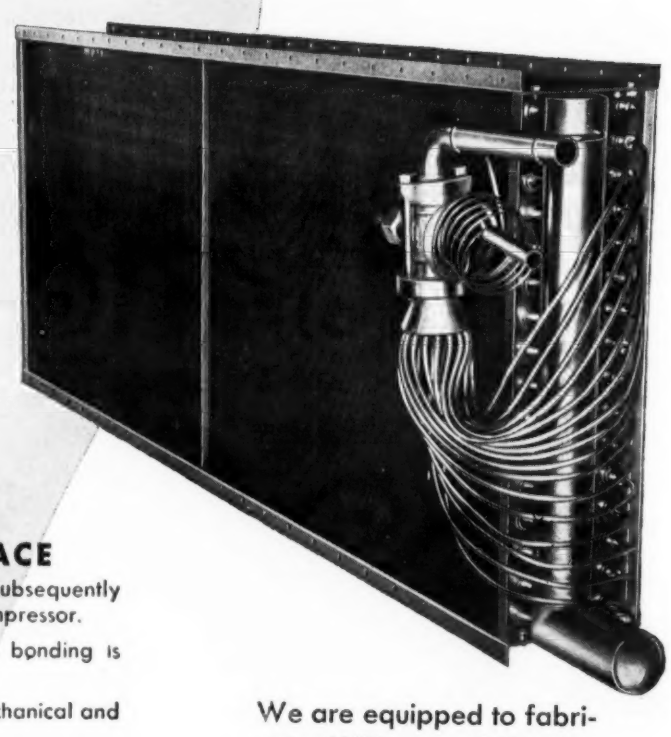
The drawback to widespread use in air conditioning systems is that Santophen 45 is not recommended for use where odors have to be considered.

The compound is available in experimental quantities at 39 cents per pound for lots of less than 1 ton.

We can't *make* ***all*** *the Heat Transfer Surface So we make the* ***Best*** *of it*

ONLY KENNARD *Engineered* COILS

Give You so Much...



CLEANER INSIDE SURFACE

Hydraulic stretching loosens scale and oxides subsequently blown OUT of coil reduces danger of scoring compressor.

SAFER COIL—Having withstood 3000 psi for bonding is safe-guarded against leaks.

UNIFORM EVEN STRESS—in ALL fins—good mechanical and thermal bond.

NITROGEN ATMOSPHERE BRAZING

All header and distributor tube joints to the coil are phos-copper brazed in an inert Nitrogen Atmosphere to eliminate abrasive scale.

NO-RUST FRAMES

Frames up to 72" are ALUMINUM. Larger sizes framed in steel, hot-dipped galvanized AFTER FABRICATION.

ONE-PIECE FINS *(ALL LENGTHS)*

Solid plate type fin for ALL coils. Reduces air resistance. Requires less fan power. Minimizes fuzz and lint fouling.

*Underwriters Laboratories Approval**

*Does not apply to water and steam coils — not required

We are equipped to fabricate ANY type of Heating or Cooling Coils (any refrigerant) as specified. Your inquiries are invited.

Write for Bulletins—
No. 47A—FINNED COILS
No. 486—AIR CONDITIONING BLOWER UNITS
No. 491—EVAPORATIVE CONDENSERS
No. 494—COOLING TOWERS

"Refinement of Detail Marks the Difference Between Ordinary and Excellent"

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Write for your copy —on your letterhead

HARRY ALTER'S SPRING-AND-SUMMER 1951 **DEPENDABOOK** No. 154

Over 9,000 Refrigeration **PARTS and Supplies**

To successfully conduct a business in these days of scarcities, you really need DEPENDABOOK No. 154 . . . If it's available you'll find it listed in this latest edition.

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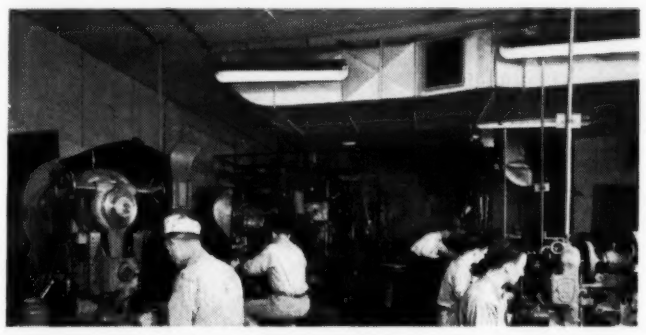
"Climate-Engineered"

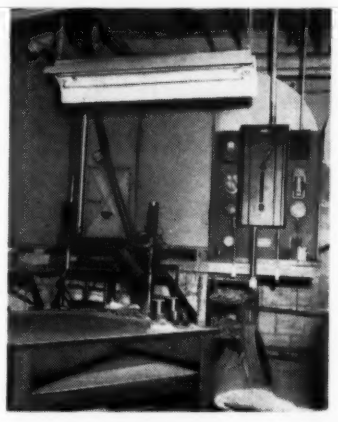
AIR CONDITIONING
REFRIGERATION
AUTOMATIC HEATING

HOW THEY WORK FOR DEFENSE

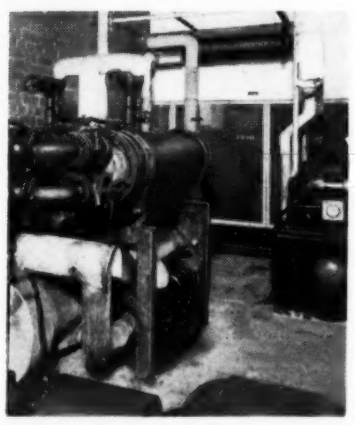
Help manufacturers build better products...faster



PROCESS AIR CONDITIONING prevents absorption of moisture by powdered metals in this plant which manufactures the cemented carbide products used in many essential industries. General Electric Air Conditioning equipment makes possible accurate weighing and blending even on the hottest, stickiest days. A similarly useful job can be done in many factories, to maintain quality and keep workers at top efficiency.



TO KEEP PRODUCTION MOVING in all kinds of weather, plastic abrasive wheels are manufactured under controlled temperature and humidity conditions. In this plant, G-E Air Conditioning equipment prevents variations in the quality of finished products, makes it possible to continue operations during weather that used to cause stoppages. Wherever ingredients, parts, or finished products are sensitive to climate, G-E Air Conditioning can make vital contributions.

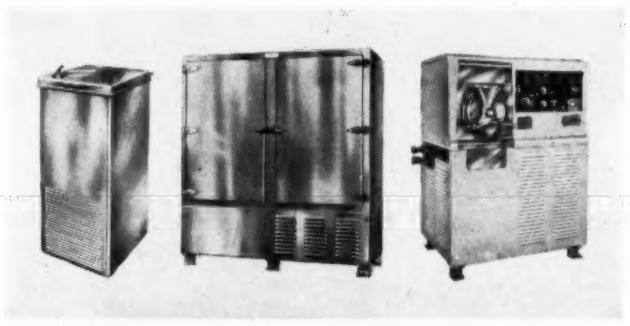


PROTECTIVE COATING by aluminum anodizing, a fairly new process, requires great quantities of direct current electricity. But this produces too much heat to maintain high quality. The G-E Refrigeration Machine (right) holds the sulfuric acid electrolyte at its best working temperature, 70° F. Water is chilled and then cools the acid as it circulates through a heat exchanger (center). G-E refrigeration helps make possible many such new processes.

Fill many military needs

TRANSPORTABLE AIR CONDITIONER shown at left is an example of the use of G-E Packaged Air Conditioners in military service. All equipment for temperature and humidity control in any climate is provided in this single compact unit. To make the best use of available space, G. E.'s "building block" design permits several variations in arrangement. Mildew, spoilage, and rotting in vital equipment and supplies can be prevented. And the efficiency of personnel can be improved.

DARK ROOMS, part of the military's extensive photography operations in all climates, are more efficient when temperature, humidity and air cleanliness are maintained by air conditioning. General Electric Air Conditioning can also help in testing, map and drafting rooms, for fur storage, link trainer buildings, control towers and other military applications.



MANY DIFFERENT KINDS OF REFRIGERATION are needed to keep the Army and Navy fit and ready, and G-E equipment has played an important part in all of them. G. E. makes electric drinking water coolers for use on land bases and aboard ship. G. E. also makes refrigeration machines for such packaged equipment as reach-in and walk-in refrigerators, ice cream freezers, and complete shipboard cooling systems.

Strengthen America on every front

DEFENSE AND MILITARY HOUSING will get inexpensive and efficient heating with General Electric furnaces and boilers, highly successful in mass developments. G-E *Air-Wall* Heating, a new distribution system featuring simplified installation and balanced heat in different rooms, has been used in many developments like the huge Doelger Project in San Francisco. G-E Oil or Gas Boilers, in multiple, provide heating for industrial plants, barracks, and other large applications.

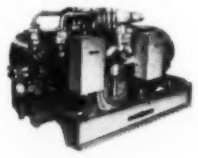
HOSPITALS throughout the country get winter heating and summer cooling with G-E Air Conditioning Systems. For example, in Wesley Hospital, Wichita, different parts of the building can be heated and cooled at the same time with a Personal Weather Control System using G-E Remote Room Air Conditioning Units. This system can be used to air condition underground laboratories, shelters, and other places where conditioned air is essential.

BLOOD SERUM is processed in a room that is air conditioned by General Electric central plant units. G-E refrigeration equipment also plays an important part in the actual processing of both plasma and whole blood. G-E truck refrigeration is used to transport plasma, penicillin and other medical supplies in addition, of course, to food and milk.

General Electric manufactures a wide range of Air Conditioning, Refrigeration and Automatic Heating products

Air Conditioning: Packaged Air Conditioners in 2, 3, 5, 7½ and 10 hp sizes. Central Plant Air Conditioners in 5 basic frame sizes; air flow range: 1,000 to 12,800 CFM. Remote Room Air Conditioners in ⅝, 1, and 1½ ton cooling capacity. Self-contained Room Air Conditioners in ½ ton size.

Refrigeration Machines: Hermetically sealed units in 7 sizes from 1/6 to ½ hp. Open units in 19 sizes from ¼ to 75 hp. Compressor units in 12 sizes from 3 to 75 hp. All refrigeration machines use "Freon."



Automatic Heating: Oil Boilers in 5 sizes from 100,000 to 450,000 Btu/hr. Oil Furnaces in 4 sizes from 60,000 to 155,000 Btu/hr. Gas Boilers in 8 sizes from 76,800 to 345,600 Btu/hr output capacities. Gas Furnaces in 5 sizes from 48,000 to 168,000 Btu/hr capacities.

Water Coolers: Pressure-Type, air cooled, in 4, 7, and 10 gallons-per-hour sizes. Pressure-Type, water cooled, in 1 size—10 gallons per hour. Bottle-Type, air cooled, 3 gallons per hour.

You can put your confidence in—

GENERAL ELECTRIC

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GENERAL ELECTRIC COMPANY
AIR CONDITIONING DEPARTMENT
BLOOMFIELD, NEW JERSEY

Air Conditioning and Defense Production

Nearly Every Phase—Manufacturing Applications, Comfort Cooling, Processing, Mining, Medicine, Civilian and Military—Is Touched and Knows Its Vital Need

DETROIT—The vital importance of air conditioning to defense production was amply proved during World War II. Its importance today in industrial and military applications is many times greater.

During World War II, refrigerated temperature control made possible the development, testing and mass production of innumerable items demanded by the armed forces and the straining civilian economy.

Air conditioning was there when the atom bomb was developed and the Norden bombsight put into production. It aided the air force in everything from training new pilots and building new planes to the drying of parachutes after a flyer had been spilled into the sea.

It kept miners on the job supplying basic metals. It allowed humidity sensitive parts to be manufactured in plants scattered around the country and yet fit perfectly in the final assembly of war materiel in other locations where humidity conditions were entirely different.

It reduced the tedium of workers handling small, intricate parts and kept their hands from sweating and thus spoiling vital instruments. It improved the accuracy of fine, precise optical instruments and kept medical supply production lines going in weather that would have closed them down tight for months.

To give readers some idea of how air conditioning aids in defense production, the NEWS here reviews some of the applications to which air conditioning has been applied since the early war years of 1942.

AIRCRAFT

One of the largest air conditioning plants in the country was installed at the **Douglas Aircraft Corp.** plant in Tulsa. The 7,000-ton refrigeration system cooled 14,000 gals. of water per minute from 59 to 47° F. Air blown over the coils held the temperature to a constant 80° F. and humidity to 50%.

Air conditioning was deemed necessary to counteract heavy heat loads from machinery and lighting in addition to withstanding outside temperatures of from 80° to 100° F.

Self-contained air conditioning units supplied 50 tons of cooling for the **parachute folding,** packing, and storing rooms at the Naval Air Station in the Republic of Panama. In tropical workrooms such as these 80° d.b. and 50% r.h. are maintained to prevent dust and excessive sweating by chute handlers. A drying tower for drying out wet parachutes also called for circulating air over the chutes at relative humidities of less than 50%.

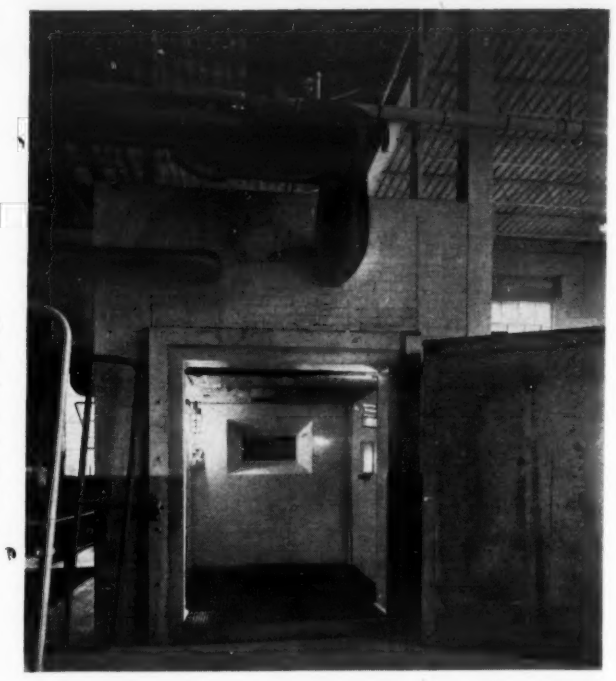
In the **manufacture of plywood** and in its fabrication and assembly, air conditioning proved to be vital. In order to have molded plywood parts that were manufactured in different plants and assembled into aircraft structures in yet another plant fit together perfectly, they all had to be fabricated under the same temperature and humidity conditions.

Problem was that plywood absorbed moisture under high humidity conditions and shrunk under low humidities. Agreed upon temperature was from 70 to 75° F. with relative humidities of from 50 to 60%.

Air conditioned rooms at the U. S. Naval Aircraft factory in Philadelphia sharply reduced rejections in the **fabrication and dope shops** due to excessive changes in humidity. The rooms were held at 80° F. with 62% r.h. Previously, work in these shops had to be suspended when the humidity rose above 68% or fell below 58%.

At Dallas, portable, mobile, self-contained air conditioning units were used to cool the interiors of **bombers,** while mechanics put on the finishing touches. To speed up production at the North American Aviation plant the almost finished planes were moved out onto the runways where the Texas sun made working conditions inside the planes unbearable without air conditioning.

Packaged air conditioning added 11 hours to the working day in the **paint and dope shops** of the aircraft and engine division of the Embry-Riddle Co. in Miami. To speed drying of



LOW TEMPERATURE test room of high-low temperature weather laboratory built for U. S. Army Corps of Engineers by Frick Co. The small cold room has its own 3-stage refrigeration system, coils, and 500 c.f.m. fan.

work, air conditioning provided 16 air changes per hour in the paint and dope shops, 30 changes per hour in the spray room, and four changes per hour in the covering room.

Protection of the **control mechanisms in Link trainers** from corrosion and dust is a primary reason why air conditioning is used in this type of air force training for fledgling pilots. Comfort of the trainees, which increases their alertness and ability to grasp the training, is a secondary consideration.

BASIC MINERALS

Air conditioning during World War II was given top priority for use in **blast furnaces.** The benefits derived were increases in iron production, decreases in coke consumption, smoother operation of the furnace, closer silicon control, savings in heat time and limestone. Results from 50 air conditioned blast furnaces, it was estimated, would equal the output of 53 non air conditioned furnaces.

To bring temperatures of 158° F., which frequently occur in its **copper mine** shafts nearly a mile underground, down to reasonable levels, the Magma Copper Co. at Superior, Ariz. has installed an air conditioning system valued at more than $1,000,000.

At Beach Bottom **coal mine** near Wheeling, W. Va., air conditioning was installed primarily as a safety measure to reduce roof falls by maintaining a constant temperature and humidity. It also provided a sorely needed improvement in working conditions for the miners.

At Inland Steel Co. **iron mine** at Iron River, Wis., the change room for the miners was air conditioned. To give the miners a chance to adjust gradually from high mine temperatures to outdoor temperatures, the work clothes room was kept at 85 to 100° F. and the clean clothes room at from 70° to 75° F.

EXPLOSIVES

Air conditioning to maintain uniform temperature and humidity conditions was employed in the manufacture of **atomic bombs** at Oak Ridge, Tenn. Equipment installations were made in the electromagnetic separation plant for the concentration of U-235, in the research laboratory to maintain highly accurate flow measurements, and in the switch house to prevent dust accumulations.

An exact temperature of 72° F. with 40% r.h. was maintained by a special air conditioning system to aid in the processing of **tracer metals** and specially prepared powder and for the storage of chemicals at the Denver (Colo.) Ordnance plant. Air conditioning equipment was set up in a separate room and coupled to preheating coils, a spray type humidifier, two sets of dehumidifying coils of the direct expansion type, and a bank of re-heating coils to meet any conceivable external atmospheric or weather conditions.

Air conditioning was employed (packaged units) for comfort and efficiency cooling of **black powder** plant at Arkansas Ordnance plant. Powder was produced in bulk for shells.

GLASS

Production of **glass** with an increased capacity for bending light rays was aided by a 290-ton air conditioning system in the Eastman Kodak Co. Hawkeye plant in Rochester, N. Y. Three floors of the plant were air conditioned. The glass was said to be used in aerial photography.

Because of the moisture problem peculiar to plastic, air conditioning is a necessity in the manufacture of **safety glass plastic,** used in planes, ships, and tanks. The Monsanto Chemical Co.'s plastic division at Springfield, Mass. carries on certain processing steps of its manufacture in air conditioned areas and uses refrigeration not only in the manufacture but in the storage of safety glass plastic.

Air conditioning is essential to the efficient assembly of **television picture tubes** at the Buffalo Tube Works of the General Electric Co. An air conditioned room is required for the assembly and precise fitting of the cathode ray gun and another is used for the installation of the "phosphor" coating on the faces of the tubes. This latter room is also pressurized.

INSTRUMENTS

Comfort air conditioning in the **glass blowing** and other departments where high temperatures were handicapping workers, almost eliminated absenteeism and increased production about 20% at the North American Phillips Co., Inc. in Mt. Vernon, N. Y.

The plant made electronic instruments for the armed forces. In the glass blowing department, where X-ray tubes were made, temperatures rose as high as 130° F. before air conditioning. Afterwards, these temperatures were dropped to 70 to 80° F.

Package Machinery Co. of Springfield, Mass. found air conditioning was a prime consideration in manufacturing **gyro-compasses** for the Navy. Without air conditioning, heat generated by the compasses would send the themometer up 25° F. in less than an hour.

To have the same conditions at all times for testing and calibrating **precision gauges** whose parts were made in various sections of the country, the Army's Cincinnati Ordnance plant installed air conditioning in the testing laboratory.

Temperature was held at 68° F. with a variation of 1° F. or less and relative humidity was held below 50%. This temperature was held even though outside temperatures ranged from 108° F. in summer to -23° F. in winter.

Air conditioning was installed at the Sangamo Electric Co. plant at Springfield, Ill. in the space where **electrical indicating instruments** for the armed forces were assembled. Purpose of the installation was to provide air cleanliness and temperature and humidity control.

MEDICAL

Air conditioning aided in the production of **penicillin** at the Bedford, Ohio laboratory of Ben Venue Laboratories of Pittsburgh by maintaining proper temperature conditions (75° F.) for the growth of molds.

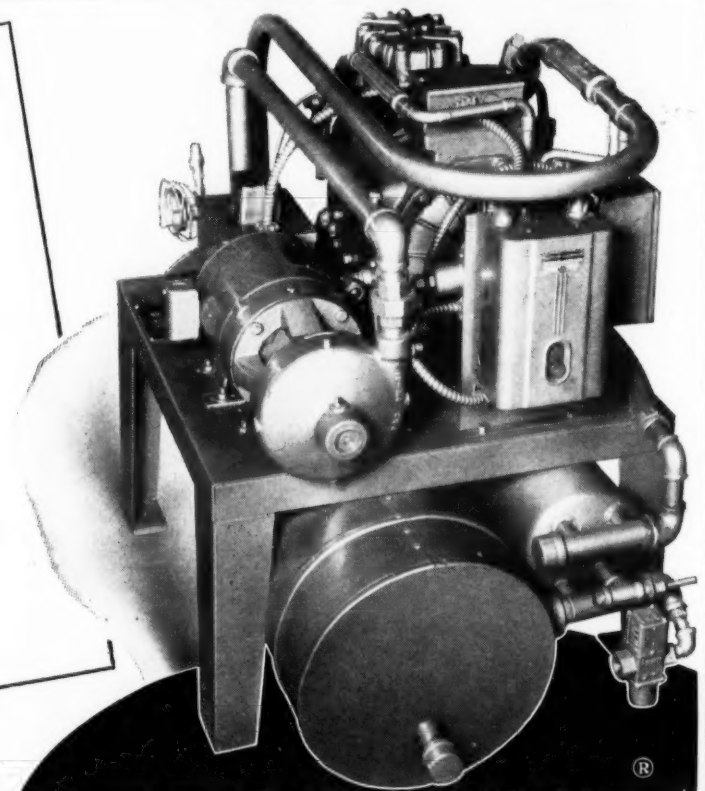
Temperature of 100° F. would destroy all the penicillin notatum in one hour. Air conditioning also screens out contaminants that could destroy a day's production in a few minutes. It also produced the bone-dry conditions under which penicillin must be packaged.

Temperatures are held to within extremely fine limits by packaged air conditioners at the **blood fractionation** laboratory of the Michigan Department of Health in Lansing. Here gamma-globulin is extracted from human blood plasma under extremely critical temperatures to fight measles and other diseases.

Two 3-hp. and three 5-hp. water-cooled units are used. One of the 3-hp.

(Concluded on page 28)

OPENS UP NEW MARKETS



Acme FLOW COLD® LIQUID CHILLERS

FOR AIR CONDITIONING
INDUSTRIAL OR COMMERCIAL REFRIGERATION

ACME FLOW COLD Units give you the ultimate in Air Conditioning, on hundreds of applications such as professional offices, institutions, hospitals, motels and tourist courts, stores, fitting rooms, hotel suites, beauty parlors, barber shops, homes and many others. Packaged and designed for use with hot water, steam or hot air heating systems. Here at last, is a simple foolproof unit for HEAT PUMP applications.

ACME FLOW COLD Units are equally efficient for cooling drinking water, and for all industrial process temperature control or commercial cooling operations. ACME FLOW COLD Units are ruggedly constructed and designed for many years of efficient, low-cost service. Matching ACME Convectors, Coils and Cooling Towers are also available.

ACME FLOW COLD UNITS ARE:

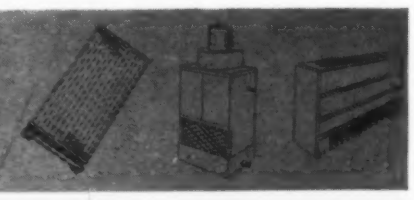
- Compact and Easy to Install.
- Designed for Applications where Space or Access is a Problem.
- Furnished *Complete* with Freon, Wiring, Refrigerant Piping, and ALL Controls, Factory Tested, Ready for Water and Electrical Connections.

Contact your nearest distributor or write direct for complete information and specifications. We are looking for a few outstanding Dealers and Distributors, to complement our fine distributing organization.

CONTINUOUSLY SERVING THE REFRIGERATION INDUSTRY SINCE 1919

ACME PRODUCTS ★★★

ACME INDUSTRIES, INC.
JACKSON, MICHIGAN

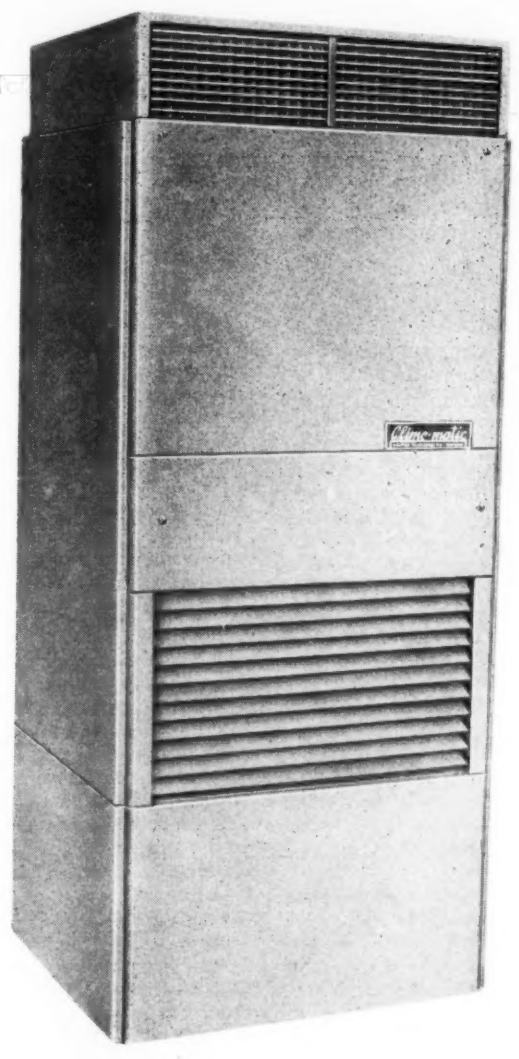


Air Conditioning by CLIME-MATIC

VITAL TO AMERICA'S PRODUCTION... NEVER MORE IMPORTANT TO YOU!

In machine and tool factory and on the production lines, in chemical and electronic laboratories, in food processing and distribution, in the armed forces program—everywhere in America is the challenge to produce faster, better, more economically. And never before has air conditioning been in such a position to serve.

CLIME-MATIC . . . proven, tested, re-designed units, embodying every desired improvement in air conditioning, can be your contribution to the manufacture of precision parts, the protection of men, machines and material, the improvement and stepping up of quantity and quality production.



Installed singly or in groups

self-contained

CLIME-MATICS in

2, 2.65, 3.5, 5.5, 8.25

11, 16.5, 20, 25 and 30

TON CAPACITIES

Finished cabinets of rugged design for installations in the area or central station requirements. Special remote control units for wall or ceiling mounting also available. ALL CLIME-MATICS feature the heavy duty accessible-hermetic Copelametic compressor.

A PROFITABLE CHALLENGE . . .

To the aggressive, solid-thinking air conditioning contractor and dealer a CLIME-MATIC franchise will present the solution for today's many sided problems that arise with every air conditioning job.

CLIME-MATIC'S varied line offers a unit capacity to fit every specific need . . . each one geared for speedy, inexpensive, profitable installation. From every standpoint you owe it to your organization to analyze these 4 statements about:

CLIME-MATIC *self contained air conditioning*

1. *FINEST, PRECISION-MADE, FIELD-TESTED LINE of air conditioning units manufactured . . . approved and rated tops by contractors, consulting engineers and best known names in commerce and industry.*

2. *HIGHEST PROFIT MARGIN of any packaged conditioning line because you are franchised directly by the manufacturer. Full parts and service guarantee protects your profits after sales.*

3. *PROMPT SHIPMENT. The complete CLIME-MATIC line of self-contained conditioners (2 to 30 ton capacities) is now available for delivery. United handles all your requirements on an open quota basis.*

4. *PRACTICAL SALES AND ENGINEERING HELP. Dealers are entitled to full use of personalized selling aid from field representatives, plant engineering staff counsel and powerful, coordinated promotional and advertising aids.*

Part of your CLIME-MATIC franchise . . .

COEY *floating film* COOLING TOWER

Finest cooling tower ever designed according to leading consulting engineers . . . incomparable for water saving efficiency, light weight, sturdy all-metal construction, quiet and trouble free operation. Get the floating film story today.

UNITED'S new, expanded plant and production facilities make available a limited number of valuable dealer franchises for CLIME-MATIC self-contained units and Floating Film Cooling Towers. Write, phone or wire for complete information without obligation.

UNITED CONDITIONING CORP.

74 VARICK STREET • NEW YORK 13, N. Y.

UNITED CONDITIONING CORPORATION
74 Varick Street, New York 13, N. Y.

We are interested in the CLIME-MATIC franchise. Please send me, without obligation, details and information on a CLIME-MATIC dealership.

NAME .....

FIRM NAME .....

STREET .....

CITY ..... STATE.....

Military Installations

LEFT: At Bremerton Naval hospital near Seattle, UsAirco installed its Modu-aire units to handle special air conditioning problems found in areas where highly explosive ether is present.

RIGHT: Three of the 19 UsAirco packaged conditioners which help keep officers and enlisted men comfortable and alert at Fort Sill Selective Service Center. Note fresh air intake ducts at side of each unit.

Air Conditioning Aids Defense Production

(Concluded from Page 26, Column 5)

units is used to refrigerate coolant for controlling the temperature of the blood plasma itself during the fractionation process. The other four machines control the temperature of the air in the entrance (38° F.), processing (20° F.), and storage (0° F.) rooms.

The Upjohn Co. of Kalamazoo, Mich. found air conditioning vital to the processing of **human serum albumin.** Albumin is an element of human blood that can be injected immediately into the patient.

When human blood is received, the process of extracting the albumin is started in a room air conditioned to a constant 34° F. and continued in another cooled to 23° F.

OPTICAL

For the optical manufacturing industry, air conditioning does these things:

Eliminates air-borne dust; eliminates perspiration on the hands of workers in the cementing and assembly rooms; eliminates air-borne glass dust that causes irritations to workers; assures proper settings of pitch and lap in the grinding and polishing rooms by holding even temperatures, assures consistency of cement used in cementing lenses; prevents etching of lens surfaces by paper wrapping during storage and by keeping relative humidity low.

A 5-hp. packaged air conditioner was installed in one government arsenal to protect various types of **fire control equipment.** Clean, dust free air properly humidified and of constant temperature had to be maintained at all times to prevent inconsistent and erratic instrument performance. The government equipment included directors, panoramic sights, range finders, and observation telescopes.

Air conditioning incorporating precipitron air cleaners were used in 16 naval air stations to provide clean air in rooms where **bombsights** were overhauled and repaired.

One leading optical company controls temperatures in its **engraving** room within limits of plus or minus ½° F. Here, engraving exceedingly fine lines on glass, sometimes 200 to the inch, calls for elimination of expansion or contraction of both glass and machine.

The same company utilizes air conditioning in rooms where **grinding** and **polishing** are done and where, in extreme cases, tolerances must be held down to five millionths of an inch.

Cleanliness and freedom from perspiration required to cut down rejects in **cementing** and **assembly** rooms are also provided by air conditioning.

PARTS

One plant producing **gears** for the Navy built enclosed rooms around each of the gear cutting machines to maintain constant temperature and humidity conditions. The rooms were of double wall construction with insulation between the inner and outer wall sheets.

Each of the **cutting rooms** was conditioned by a separate system consisting of a cooling coil and a heating coil, a compressor, and the necessary connections.

Holding room temperature and humidity constant helped an **abrasive wheel** manufacturer to standardize his drying time, binder compound consistency, and batch weight of abrasive ingredients.

Production of the world's smallest **ball bearings**—some as tiny as 2 mm. o.d.—would be seriously hampered without the three air conditioners in the finishing and inspecting departments of Miniature Precision Bearing's plant in Keene, N. H.

Air conditioning is necessary because even a microscopic particle of dust in them would produce a large obstacle to the rolling balls. Stabilization of temperature and humidity prevent etching, keep the finished parts free of corrosion and condensation, and allow precision measuring.

All of this is in addition to the comfort of the workers. (Bearings such as these were used in the Norden bombsight).

PHOTOGRAPHY

Dark room, enlarging room, and camera room of the Brown university **microfilming** laboratory are air conditioned to keep a constant 68° F. and 50% r.h. the year-round.

Air must be kept dust free because of the smallness of the printed matter on the film. One dust particle on the film or one scratch caused by dust may obscure a whole word completely.

Temperature control is also essential in obtaining even results in processing, and humidity control serves to keep a perfect storage condition for the film. Humidity control also helps toward a precise control of processing and drying.

Delicate **spectographic** equipment—used to analyze the chemical content of metals—is air conditioned by a 7½-ton air conditioning unit at a plant in Springfield, Mass.

To assure accuracy in the analyses, air conditioning is required to keep dust away from the spectograph and to maintain the constant relative humidity needed to assure consistent performance of the arc interrupter device.

Emulsified plates or films must be stored under carefully controlled conditions of temperature and relative humidity to prevent deterioration. Constant temperatures are important in maintaining a fixed focus in the optical equipment.

A 25-ton compressor that would pull the temperature in an 8 by 10-ft. **cold room** from 100° F. to -30° F. in 15 minutes was used to help student Army photographers learn to make corrections for the extreme cold prevalent in high altitudes.

RESEARCH

A wind tunnel at the Ballistic research laboratory at Aberdeen Proving Grounds in Maryland, used five centrifugal compressors to produce chilled air for the testing of **armor piercing projectiles.**

The winds developed simulated the air pressures that the projectile would encounter in flight at supersonic speeds. By such testing, designs were developed to reduce wind resistance in the projectiles and increase their striking power.

At the Elgin Field, Fla. air force proving ground, big **aircraft cannon** were tested on their ability to operate after a 140° F. temperature drop. Tests were made in an air conditioned firing range that was claimed to be the world's shortest. It measured 22 ft.

Twin steel vacuum chambers were used to duplicate temperature and air pressure in the stratosphere, nine miles above the earth. The gun to be tested was placed in one chamber, called the strato-chamber, while its muzzle projected slightly into the second, called the concussion chamber.

The projectile was fired across the 22 ft. of the concussion chamber into a sand trap chamber of reinforced concrete backstopped by 20 tons of sand.

For 12 hours prior to testing, refrigerant is circulated through coils in the upper portion of the chambers until the temperature drops below -70° F.

Just before each test the air in these chambers is warmed by electric heaters to 70° F. to simulate the start of a stratospheric flight. When the chambers are loaded and sealed, the warm air is withdrawn. The cold air together with the refrigeration built up in the walls will drop the temperature all the way back to -70° F. in 12 minutes. At the same time, pressure is reduced to a partial vacuum of 2.2 p.s.i.

ENGINEERING

The Erie City Iron Works (Erie, Pa.) found that it needed comfort cooling in its crowded **drafting room** when draftsmen were required to work seven days a week and as many nights as possible during the hot, humid summer.

It also solved the dust problem which means dirty drawings and poor blueprints, and the humidity problem that caused paper stretching and shrinking with resultant errors in scale and registry.

Air conditioning was found essential in the **drafting room** of Higgins Industries here, which turned out PT boats and Liberty ships. Air conditioning had to battle temperatures of 100° F. with 90% humidity commonly found in New Orleans.

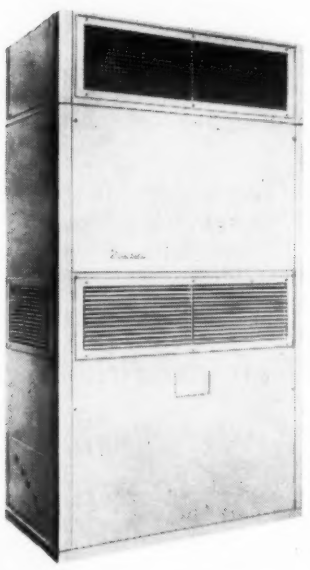
Every **office** at the National Forge and Ordnance Co. in Warren county, Pa., was equipped with a packaged air conditioner while sales, engineering, stenographic, and accounting rooms had multiple installations.

OTHER APPLICATIONS

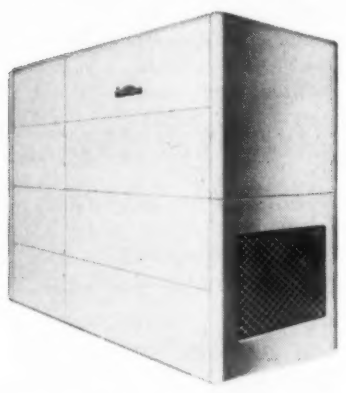
By maintaining humidity at the proper level through air conditioning, manufacturers were able to store **sandpaper** so that dampness would not deteriorate it and dryness would not cause the abrasive to become detached.

Packaging **dehydrated foods** for the armed forces was facilitated by the use of air conditioning to keep humidity at a low point. High relative humidity in the packaging room would cause too great a moisture regain in the dehydrated food product.

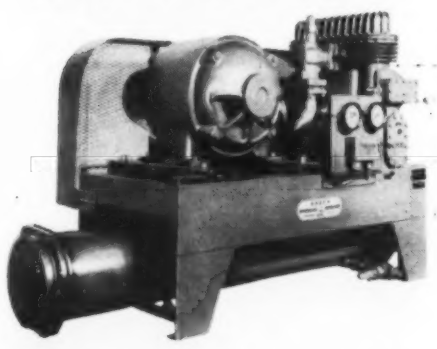
To keep humidity conditions at a minimum while workmen hand wrap thin insulation paper around extra high voltage underground cables, the Detroit Edison Co. has rigged up a portable air conditioner to control air in the **manholes.** The 3-hp. unit is mounted on skids and set next to the shanty covering the hole. It reduces the air inside the shanty and manhole to 34° dewpoint. Relative humidity in the manhole runs around 35% and the dry bulb temperature about 70° F. The company has three of these air conditioners.



Bakeraire — completely self-contained unit in 3, 5, 7½ and 10-ton capacities for single or multiple installation with or without ducts. Compact, extremely quiet, easily installed for summer and winter air conditioning.



Central-Air — complete air conditioning system with built-in evaporative condenser in capacities from 5 to 40 tons. Unit construction simplifies installation inside or outside building. Zone control permits flexibility of application.



Refrigeration Equipment—a full line of Baker Ammonia and Freon compressors, air handling equipment, valves and fittings meet exact specifications for every type of air conditioning and refrigeration installation.

Solved!

...precision industries' "tolerance" problems
...with BAKER air conditioning

Control OF THE AIR IS VITAL IN THESE CRITICAL AREAS

Gauge rooms
Chemical laboratories
Testing rooms
Inspection rooms
Optical plants
Photographic darkrooms
Biological laboratories
Finishing rooms
Tool and die rooms
Dispensaries
Precision machinery
Research laboratories

Extremely close tolerances are common in today's precision industries . . . tolerances that are demanded in building the complex machinery of our defense effort. To successfully maintain these tolerances, the temperature, humidity and cleanliness of the air must be closely controlled.

It is here that Baker air conditioning equipment has proved essential. From the smaller 3 to 10 ton Bakeraire units, the 5 to 40 ton Central Air units, through the largest engineered installations running into hundreds of tons, Baker refrigeration equipment has met the most severe operating requirements.

Today, as for more than 45 years, Baker is ready to provide American industry with the equipment and the engineering know-how needed to achieve "control of the air" . . . wherever it may be called for.

Baker Refrigeration Corporation
South Windham, Maine
Offices in principal cities throughout the world

"Intentionally better since 1905"

Baker
AIR CONDITIONING and REFRIGERATION

Using Mechanically Refrigerated Air Conditioning Installation For Dehydrating Seeds Boosts Rate of Germination

WELLINGTON, New Zealand—An application of the heat pump principle supplied by a mechanical refrigerated air conditioning installation is used in the automatic seed dehydration plant operated here by F. Cooper, Ltd.

Installation was made by Frigidaire Div. of General Motors New Zealand, Ltd. (The installation was a third prize winner in the central-system type installation section of the NEWS' contest for most unusual air conditioning applications.)

The whole dehydration plant is automatic and self-contained, the seeds moving along on trays carried by a conveyor through the whole drying cycle.

A 5-hp. Frigidaire condensing unit furnishes the necessary dehumidifying and heating effect.

In the operation of this automatic seed system dehydration plant the moisture laden inlet air (see drawing) passes through viscous filters to remove dust and any foreign matter before entering the multipath evaporator, where the temperature is lowered and the excess moisture extracted and drained away.

The air then passes through the condenser coils which heat it and raise it to approximately 78° F. with the relative humidity at 24%. This conditioned air is dispersed through the moving seed container by two forward curved multi-vane centrifugal fans, and via specially designed ducting and diffusion systems.

Thus, the complete heat pump cycle is used in the refrigeration application. Both the heat extracted in the process of dehydration and the heat rejected in the condensation of the liquid refrigerant are put to useful work, making the plant very efficient and economical to operate. The cycle is continually repeated while the plant is in operation.

Air inlet and exhaust junctions are used only when the plant is installed in localities where periods of high temperature at low relative humidity are encountered. A percentage of outside air can then be used to speed up drying when the seed is damp due to wet conditions during harvesting.

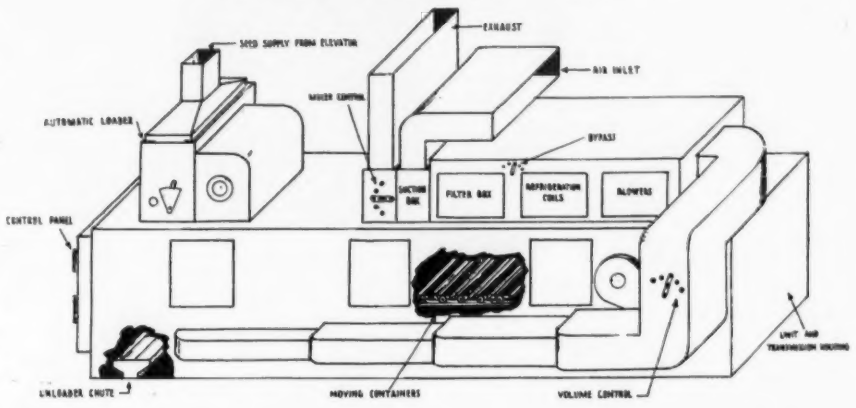
Over-all dimensions of the plant are 24 ft. long by 7 ft. wide by 9 ft. high, and the seeds treated are the more delicate varieties of vegetable seeds, such as parsnips, onions, carrots, and some varieties of flower seeds.

Before the application of the refrigeration system was tested, the batch system had been used and dehydration was carried out on the kiln principle where standard air was treated to lower the relative humidity before being circulated through the seed containers.

The percentage of germination with this method was said to be far from being completely satisfactory, and the user said that a high increase in germination was realized with the refrigeration method, and much seed harvested under damp conditions is recovered where previously it was a complete loss.

The temperature of the conditioned air is automatically controlled by the auxiliary water cooled condenser and special pressure actuated water valve. The auxiliary water cooled condenser-receiver enables excess heat to be rejected through the water cooled condenser during warmer weather when ambient temperatures are high.

AUTOMATIC SEED DEHYDRATION PLANT



DRAWING of automatic seed dehydration plant shows equipment used and the general course of the operation of the system which was installed in Wellington, New Zealand by Frigidaire Div. of General Motors New Zealand, Ltd.
This installation won third prize in the central system type installation section of the NEWS contest for unusual air conditioning applications.

Westinghouse Offers 72 Sound Films for Loan

PITTSBURGH—Seventy-two sound films that cover general interest subjects, product information, and training and instruction courses are listed in a new 1951 sound-film catalogue available from the Westinghouse Electric Corp.

Divided into three sections for easy reference, the catalogue (B-4761) provides a page of descriptive text (with illustrations) for each film. Under each title is a list of people the particular film should interest; and film size, projection time, type of film, and shipping weight are given.

Typical films are: General interest —"Electrical Proving Ground"; product information—"It's CSP for Me!"; training and instruction courses—"Hints on Electrical Servicing In the Air Conditioning Industry."

All films are loaned free to organized groups, such as church, social, professional, civic, and business—cost of transportation must be paid by borrower.

Automatic Firing Names New Air Conditioning Line Distributors

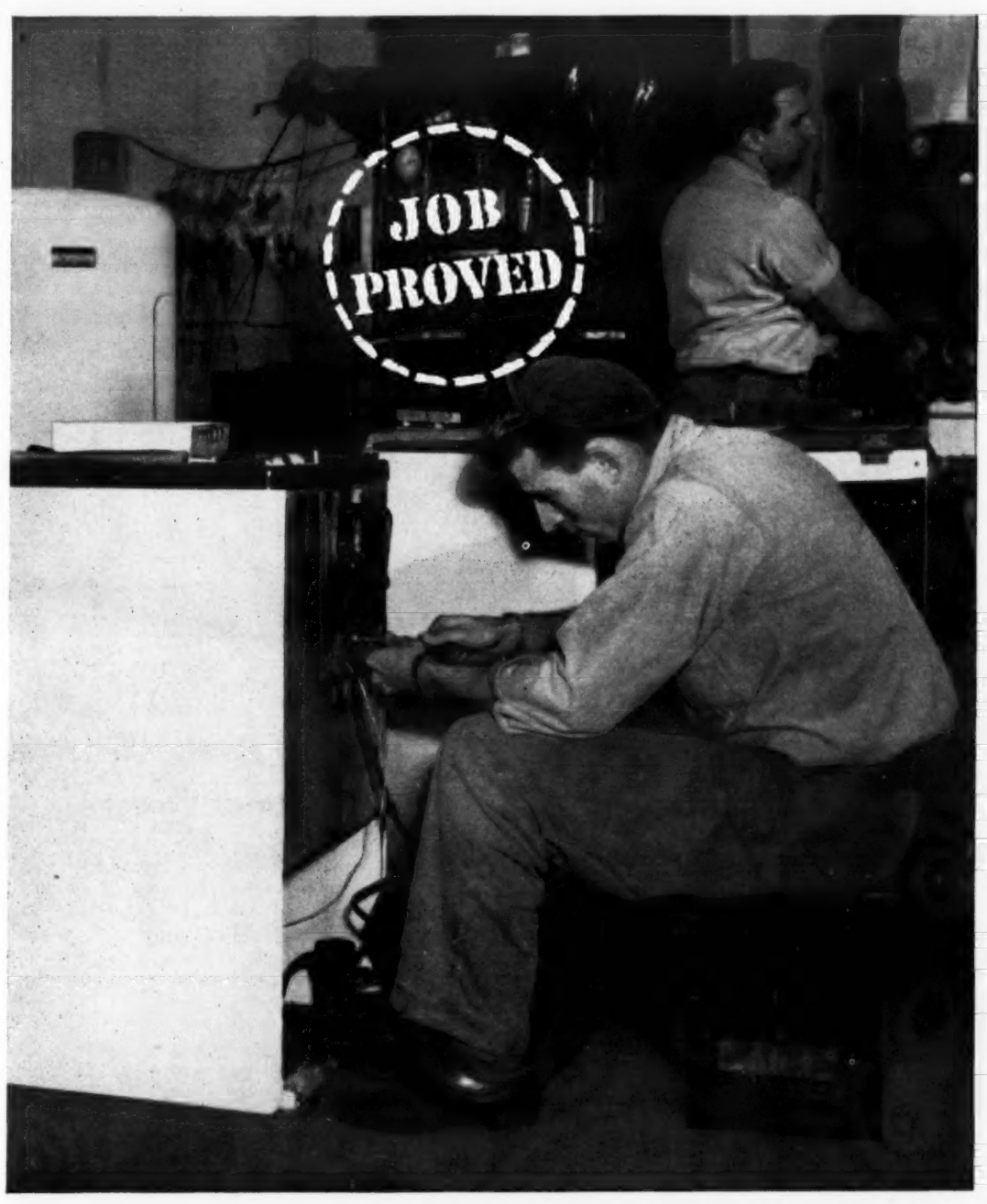
ST. LOUIS—James J. Lee, vice president in charge of sales of Automatic Firing Corp. here, has announced the appointment of several new franchise distributors for the company's air conditioning line.

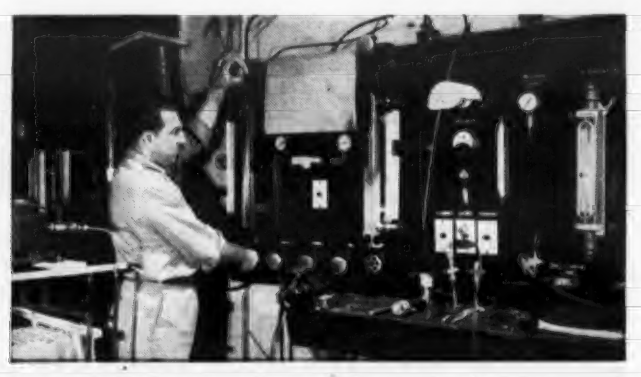
For Cool-A-Matic room coolers, packaged air conditioners, and the Fridg-A-Fire combination heating and cooling unit, the following distributors were appointed:

At Greenville, N. C., and Columbia, S. C., Carolina Sales, James Little, president; at Gastonia, N. C., Moore & Stewart, S. M. Stewart, president; and at San Antonio, Tex., Alamo Distributing Co., H. L. Roper, president.

New distributors for the Cool-A-Matic room cooler are:

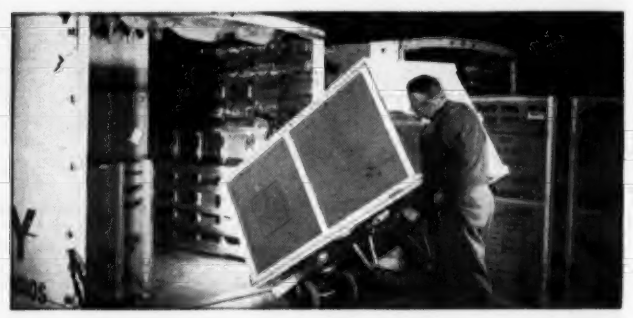
At Newark, N. J., Mytelka and Rose, Frank Rose, president; and at Dallas, Tex., Texas Wholesalers, Inc., Will J. Schnelle, president.





HERMETICALLY sealed compressor at extreme left receives new charge of Suniso under pressure from 55-gallon drum on floor above. The charging board measures the exact charge required, delivers it moisture-free and clean.

SOME refrigeration oils deposit wax in the capillary tubing of domestic units, requiring them to be dismantled and cleaned. Judson C. Burns prevents such costly callbacks by recharging exclusively with waxfree Suniso.



BY USING Suniso Refrigeration Oils exclusively, Judson C. Burns, Philadelphia, has spared himself emergency calls due to oil trouble. This has left him free to continually take on new contract accounts.

BECAUSE OF the reliability of Suniso Oils, units like the Crosleys being loaded on Burns' truck for delivery remain trouble-free for years. In fact, some of his units have required only routine maintenance over a period of 24 years.

TROUBLE-FREE PERFORMANCE OF SUNISO OILS HELPS BUILD BIG SERVICE-SHOP BUSINESS

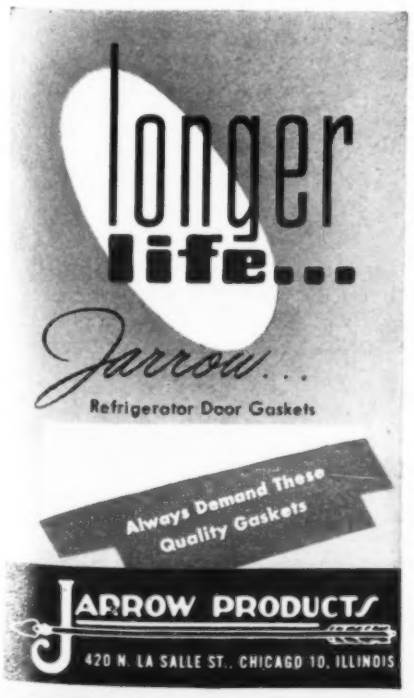
For 24 years, complete reliance on Suniso has paid off for the service department of Judson C. Burns, one of Philadelphia's largest distributors. Today Burns keeps a staff of 8 commercial service men, 8 shop service men, and 4 installation crews profitably busy. They are able to service nearly 1,000 commercial and industrial units a year because they are not handicapped by a multitude of callbacks. Some units, originally charged with Suniso, have been operating since 1926 with never a trip to the shop.

Service men everywhere have come to expect such performance of Suniso Oils. Suniso Oils flow back easily to the crankcase from the cold side of the refrigeration system; they do not deteriorate and turn to gum when mixed with Freon or other modern refrigerants; being practically wax- and moisture-free, they do not clog or freeze in capillary tubes and expansion valves. For a free Suniso Specification Card, call your jobber or write Department RN-4.

SUNISO REFRIGERATION OILS

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

SUNOCO®



Servicing Hermetics In the Field

This is the third instalment in a new series of articles written to show the serviceman what he can do about servicing hermetic systems in the field. Numerous complaints can be taken care of in the field, while other troubles require that the unit be replaced or rebuilt in a properly equipped shop. These articles will help the serviceman decide which should be done.

* * *

How To Check Relays & Overloads on Hermetics

By Arne Perttola, Owner and Manager,
Brighton Hermetic Service, Detroit

CHECKING RELAYS AND OVERLOADS

Relays and overloads will become defective through long periods of use or through overloaded conditions within the motor-compressor unit.

If the unit has been cutting out on the overload device, the overload will become defective in a rather short period. As we previously stated, some overloads are incorporated in the relay itself. With this type, to replace the overload the serviceman replaces the relay. Where the overload is separate from the relay only the overload need be replaced. In either case, the cause of the overloaded condition should be corrected before replacing the overload.

Any tampering with overloads and relays in the field is very unwise. It is much better to disconnect the unit if a replacement relay or overload is not available.

An ammeter is a very useful and essential instrument for checking hermetic units and relays. To check a relay and overload, first remove the wires from the terminal posts of the compressor unit. (Be sure that you mark the wires in some manner so you'll be able to replace them exactly as they were.)

Run the compressor directly through the ammeter, as shown in Fig. 5. Allow the compressor to warm up, and then check the reading of the ammeter against the ampere rating on the nameplate of the unit. If the reading of the ammeter is very close to the rating on the nameplate, the unit is okay, but the relay probably is defective and should be replaced.

REPLACING RELAYS

Today the wise hermetic unit serviceman carries a good selection of relays instead of belts as he did when he was servicing open machines. There is a smaller investment involved in a good "car stock" of relays than in an equally broad car stock of belts.

The serviceman should not install a replacement relay on a hermetic unit if he does not know the ampere rating of both the relay and the unit. Most relay manufacturers will furnish on request a chart showing ampere ratings of their relays and overloads. If the serviceman has an ammeter, it is a simple matter to select the proper size relay to match the unit.

CHANGING RELAYS FROM ONE TYPE TO ANOTHER

Changing from one type of relay to another should only be done as an emergency measure. It is not common practice, for the relay on the unit, in most cases, was designed specifically for that particular unit to obtain the longest life of the unit. Should it become necessary, however, to replace the relay with a different type, great caution must be used.

When replacing a relay with one of a different type, the following steps should be taken:

1. The ampere draw of the unit must be checked when the unit is under normal operating conditions and temperature.

If the unit is colder than the normal operating temperature, the current draw will be high. If a relay were installed to correspond with the current draw under these conditions, the unit may fail to start or it will stay in the starting winding too long, depending on the type of relay used. Also, the unit would be left with little overload protection.

The same will be true if the amperage is read while the unit is operating under some other abnormal condition, such as a warm evaporator or a dirty condenser.

2. The wiring hookup should be quite clear to the serviceman.

Some relays can be wired in so that they give little or no overload protection whatsoever and still operate perfectly. And, as we previously mentioned, some relays do not have protective overloads built in them.

Relays containing protective overloads cannot be replaced by relays using separate overloads. For example, do not replace a Delco or G-E relay (which have built-in overload protection) with a Spencer or Westinghouse relay. However, if a Spencer overload is good but the relay (Spencer) is defective, the relay can be replaced with a properly rated Delco or G-E relay provided the overload is left in the circuit and the relay is properly mounted and connected.

(To Be Continued)

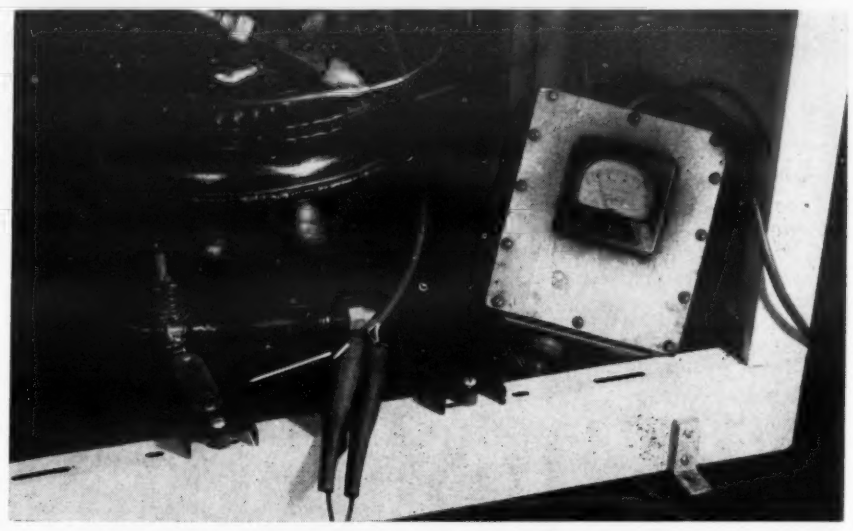


Fig. 5 shows an ammeter being used to check the running characteristics of a hermetic unit. Current for the unit runs through the ammeter to alligator clips (see arrow) attached to the running leads of the unit.

What the serviceman should know about "VIRGINIA" REFRIGERATION products

To Charge a System, Use Refrigerants That Are Consistently Pure, Consistently Sure...

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"Extra Dry" is the refrigeration grade SO_2 that service and maintenance engineers have endorsed for more than 20 years. Comes in all popular cylinder sizes.

"V-METH-L" (B. P. —10.7°F.)

Virginia Methyl Chloride is made specifically for refrigeration use. Low moisture content, low acidity and narrow boiling range recommend "V-Meth-L" for the most exacting requirements.

"FREON" REFRIGERANTS

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"FREON-12" "Boiling Point" —21.6°F.
"FREON-22" "Boiling Point" —41.4°F.
"FREON-113" "Boiling Point" 117.6°F.
"FREON-114" "Boiling Point" 38.0°F.

Virginia Smelting Company is distributor for Kinetic's "Freon" Refrigerants.

HOW TO SEAL CASES, INSPECTION PLATES, PIPE OPENINGS

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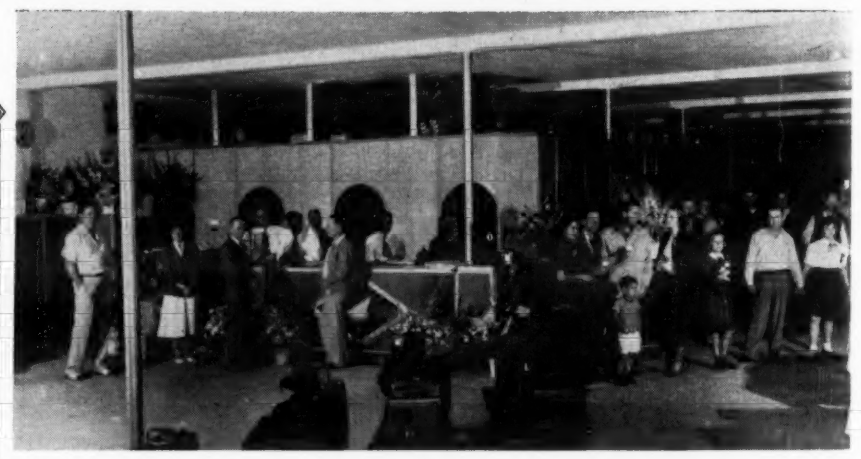
VIRGINIA Refrigerants



OPEN HOUSE at Graves Refrigeration, Inc. in Miami, Fla.

Miami Parts Wholesaler Celebrates Opening Of New, Larger Store

MIAMI, Fla. — Graves Refrigeration, Inc., refrigeration and heating parts wholesaler here, recently held an open house to celebrate the opening of a new store at 560 N.W. 29th St. here.

The company was formerly located at 3807 E. 2nd Ave. The move provides a more central location and about 6,000 sq. ft. of floor space. It has enabled the firm to add several different lines such as insulation, Penn heating controls, and filters.

A lot adjoining the new quarters has been taken over to serve as a parking lot for customers.

Jack Brown and his assistant, Bob Skidmore, handle sales at the counter while Harry Spurdle handles outside sales. Three more employes have been added to the staff.

Chattanooga Furniture Store To Air Condition 6 Floors

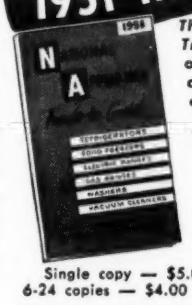
CHATTANOOGA, Tenn. — The basement and five floors of the six-floor Clemons Bros. Co. furniture store building here will be air conditioned at a cost of about $50,000, Earl W. Winger, president of the firm, announced recently.

Winger said the contract for the work has been awarded to the Corlew Engineering Co. here. Work is scheduled to be completed in June of this year.

Worthington packaged units will be used to condition the 85,000 sq. ft. of floor space, Winger declared. The street floor will be cooled by three units and the basement and above-the-street floors will be handled by two units each. Total capacity will be about 73 tons.

Two cooling towers will be erected on the roof. The top floor, which is used as a warehouse, will not be air conditioned.

JUST OUT!
1951 Trade-In Guide



The National Appliance Trade-In Guide — the only reference book covering these 6 groups of major appliances:
● Vacuum Cleaners
● Electric Ranges
● Refrigerators
● Gas Ranges
● Freezers
● Washers

Single copy — $5.00
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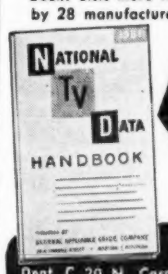
Show your customers you are offering them a square deal by showing them authentic, up-to-date valuations of their used appliances! National Appliance Guide helps you promote trade-in deals on a sound, profitable basis.

Now, with the purchase of each 1951 National Guide, we send you without additional cost a copy of the valuable National TV Data Handbook. Lists more than 800 TV receivers marketed by 28 manufacturers from 1946 through 1950.



TV DATA HANDBOOK

National TV Data Handbook — first with the most complete listings in this new field.

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Current Literature Available

To obtain further information on the literature listed below, please refer to key number preceding listing. Please use the "Information Center" form on "What's New" page.

New Foil Identification Decals Described

——KEY NO. M-450——

SEATTLE—A four-color, double-fold brochure, describing "Metal-Cals," a new permanent identification device, has been issued by the manufacturer, the C & H Supply Co., Metal-Cal Div., Boeing Field, here.

The brochure specifies advantages, limitations, sample usages, method of application, and test reports on the product.

Metal-Cals consist of a .003-in. thickness of aluminum foil anodized and dyed to rigid specifications. They are backed with a high tensile bonding material and can be applied quickly to any smooth, cohesive surface on metals, porcelain, bakelite, polystyrene, glass, wood, paints, or enamels, according to the company.

Metal-Cals are claimed by the manufacturer to be superior to both decals and nameplates as a permanent method of applying trade names, trade-marks, insignia, numbers, specifications, dealer service nameplates, diagrams, instructions, operating or maintenance directions, and dial and gauge markings.

Precision Equipment Issues 2-Color Booklet

——KEY NO. M-451——

CHICAGO—A two-color circular listing steel shelving, waste receptacles, clothing lockers, storage cabinets, and other steel equipment has been published by Precision Equipment Co.

New Book on Oil Burners Written by Burkhardt

——KEY NO. M-452——

NEW YORK CITY—"Domestic Oil Burners—Installation and Servicing," a new book by Charles H. Burkhardt, provides the latest service and mechanical information on gun type, rotary, and vaporizing-pot domestic oil burners. It was published in April by the McGraw-Hill Book Co. here.

This book thoroughly covers the operating characteristics of each type of domestic oil burner, and analyzes what design differences in the various models mean to the installation and serviceman.

It presents proven procedures for correctly sizing, designing, and building combustion chambers as well as detailed and illustrated working data on each phase of burner installation, service, and maintenance.

Numerous charts that simplify trouble-shooting efforts, plus a highly specialized treatment on how to service individual parts of the oil burner mechanism, are two helpful features of this volume.

Charles H. Burkhardt is heating editor of *Sheet Metal Worker* and *Plumbing and Heating Journal*. He conducts special research and test projects and develops training manuals for oil burner and accessory equipment manufacturers and serves as heating consultant for several building firms in the New York area.

"Domestic Oil Burners—Installation and Servicing," is priced at $6.00.

Peerless Pump Bulletin Covers 'Fluidyne' Line

——KEY NO. M-453——

LOS ANGELES—A new Peerless Pump bulletin has just been published by Peerless Pump Div., Food Machinery & Chemical Corp., comprehensively covering the company's horizontal "Fluidyne" pump line.

Peerless Fluidyne pumps are of the horizontal, end-suction centrifugal type and may be driven by electric motors in sizes from ¼ to 150 hp., affording a capacity range from 10 to 5,500 g.p.m. Liquids can be pumped against heads up to 260 ft.

Two types of pumps are offered in the line. One is a close-coupled electric motor driven pump, designated as the Peerless type PE. The other, designated as the Peerless type PB, is a bracket-mounted pump for driving through a flexible coupling, or V-belt, or flat-belt pulley.

Fluidyne pumps are particularly adapted to continuous duty pumping of water and other clear liquids in a wide variety of services, as well as for application to system assemblies, such as air conditioning, bottle washers, commercial laundry equipment, and dairy equipment.

Fluidyne pumps may be installed and will operate in any position—vertical, horizontal, or intermediate angle. Eight or more positions of the discharge opening (depending on pump size) provide flexibility of installation.

UL Publishes Findings On Magnesium Alloys

——KEY NO. M-454——

CHICAGO—Underwriters' Laboratories, Inc. has released a new Bulletin of Research, No. 45, entitled "A Determination of the Acceptability of Magnesium Alloys as Enclosures For Portable Electrical Appliances."

A general investigation was undertaken to evaluate the fire hazard involved in the use of magnesium alloys for portable electrical appliance enclosures, UL said.

"The assumption was made that an electrical failure would be accompanied by arcing and that the resulting fire hazard might be increased by the presence of the magnesium alloy," it was explained. "Limited ranges of performance were investigated, utilizing carbon-to-magnesium arcs, on both direct and alternating currents.

"The results of this investigation indicated that under certain conditions untreated magnesium alloys would be acceptable for use as enclosures for portable electrical appliances. These limitations are judged to provide reasonable factors of safety for general design purposes. It is believed that in a specific appliance one or more of the limitations might be extended without increase in fire hazard."

Schaefer Has Catalog On Ice Cream Cabinets

——KEY NO. M-455——

MINNEAPOLIS—A new descriptive catalog covering its complete line of 13 ice cream cabinets has just been issued by Schaefer, Inc.

The book is pocket-size with a durable cover and contains 20 pages of illustrations and complete specifications covering Schaefer's eight models for dipping and storage, the Clearview sliding glass top merchandisers.

In addition, this book illustrates and gives complete specifications on Schaefer's model MC-9 bottled milk cooler.

This new catalog is designated Form Number 188. Copies may be secured upon request.

'Precipitron' Story Told In Lay Language

——KEY NO. M-456——

BOSTON — An eight-page leaflet that describes the "Precipitron" electronic air cleaner in non-technical lauguage is available from Westinghouse Electric Corp.

Air cleaning units for factories, for stores, for offices, and for homes are covered. The leaflet (SA-6691) describes the Precipitron and explains how it operates; where it can be used to advantage; how it is constructed; and, the kind of unit to select for a given job of air cleaning.

MacDermid Has Bulletin On Cleaning Compounds

——KEY NO. M-457——

WATERBURY, Conn. — MacDermid, Inc. here has recently compiled a technical bulletin listing the cleaning compounds and other chemicals which the company now has available for immediate delivery to the metal finishing industry.

The bulletin is composed of three sheets, the first devoted to cleaning compounds for steel base metals, the second for brass and zinc die castings, and the third to the company's specialties.

Universal Cooler Exhibit at Buffalo Was Indicative of Policy as Division of Tecumseh

At the last of the REMA-RSES Educational Conferences and Exhibit held recently at Buffalo the Universal Cooler Div. of Tecumseh Products Co. shared a large exhibit space with its parent company, which purchased Universal Cooler a few months ago. However, each display was a separate entity, manned by separate personnel. This is in line with the announced policy of having the Universal Cooler Div. continue in the manufacture and distribution of its own lines of condensing units, under the general management of Tecumseh. At the left some visitors to the Buffalo Exhibit examine some cutaways of Tecumseh units, while at the right a group studies Universal Cooler's glass evaporator display showing the operation of a capillary tube metering device.

THE MASTER SERVICE MANUALS — — —

— — — and other books of the Refrigeration Library are depended upon as textbooks in trade schools from coast to coast.

BUSINESS NEWS PUBLISHING CO., DETROIT

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America gains great strength because of its unrivaled distribution of fresh, nourishing, perishable foods to the mass of its people. Tyler, a leader in the vital commercial refrigeration field (for food stores, restaurants, bakeries, hotels) is also a leading producer of home and farm freezers.

This 28-page illustrated booklet gives complete data on Tyler facilities—part of which will be available for defense work.

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did you hear the one about the traveling serviceman?...

He visited around the world and was tickled pink to find *Ranco* controls just about everywhere!

Of course, when you consider that there are more than 35,000,000 Ranco controls now in use, it's no wonder our perambulating globe-trotter found a lot of them.

See your Ranco wholesaler now. He has the most complete replacement line ever offered. And remember—from Kokomo to Tokyo—in nearly every land . . . *top-quality Ranco controls are always in demand!*

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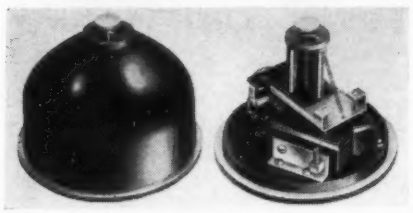
WORLD'S LARGEST MANUFACTURERS OF REFRIGERATION CONTROLS

What's New

When requesting further information on new products, please use "Information Center" form.

Type W Sarcostat Actuated by Weather, Pressure



——KEY NO. A-450——

NEW YORK CITY—A new modulating control for steam and hot water systems that is actuated by weather and pressure has been introduced by Sarcotherm Controls, Inc. here.

Called the Type W Sarcostat, the control governs the volume of steam to heating systems in relation to the outside temperature. The steam may be supplied directly to steam radiators and convectors heating water for forced hot water heating systems.

The Type W Sarcostat automatically feeds only enough steam to the building, heating zone, or convertor to balance its heat loss under any given weather condition. Equal distribution is assured through the use of orifice plates in steam radiator valves.

Through the control panel furnished with the valve it is possible to provide night shutdown and quick morning pickup at any predetermined time.

The heart of the Sarcostat system is the fully modulating master control which is fitted on the main steam line or in each zone.

In hot water systems supplied through convertors, this control is installed in the steam supply to the convertor.

The throttling position of the valve is determined by the outdoor bulb and also by the steam pressure existing in the system (or in the convertor).

The liquid-filled outdoor bulb acts to open the valve wider as the weather gets colder. However, a control mechanism saves heat by preventing the valve from opening any wider than is required to provide sufficient pressure in the system for a given outdoor temperature.

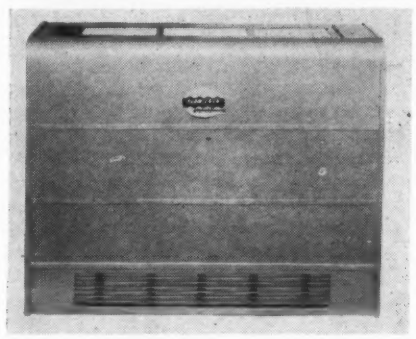
The control mechanism, actuated by the steam or vapor pressure in the system, positions the fully modulating valve at various intermediate points. It automatically maintains predetermined pressures for different outdoor temperatures.

The Sarcostat master control is equipped with an electro-hydraulic motor valve. It is fully modulating and closely balanced. The valve operator, actuated by hydraulic pressure, moves the valve by direct thrust—without resort to fragile pilots, gears, or levers.

The standard control panel has a four-position switch and a combination time switch for automatic night shutdown and morning pickup. Optional panels can be furnished to include temperature and pressure indicators.

The price of the Type W Sarcostat system depends upon the master valve which is available in sizes from 1-in. to 8 in. The 1-in. valve, with outdoor bulb and tubing, lists at $655. The price of the standard panel is $92 list and the orifice plates are $1 to $1.20 each list.

'Flow Cold Convector' Features 3 Speeds



——KEY NO. A-451——

JACKSON, Mich.—Carl W. Millsom, manager of Acme Industries' Flow-Cold division, announced recently a new Acme product which will soon be available, the "Flow-Cold Convector."

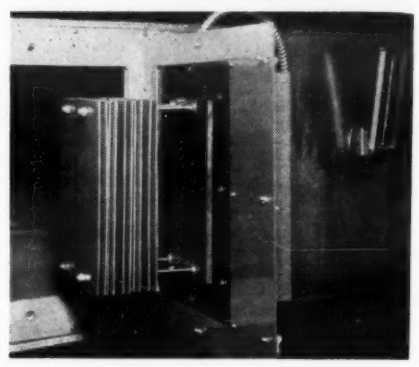
The unit was designed for use with Acme Flow-Cold units and is intended for summer air conditioning, or to be used with heat pump systems or boiler systems for year-round air conditioning. It was further designed for floor, wall, or ceiling installation.

The convector features three speeds for individual personalized control and provides oversized, slow speed blowers for quiet operation; requires only simple electrical and water connections; and is provided with large filters. It also comes equipped with a built-in capacity adjustment.

Ample space has been provided for automatic controls inside the cabinet. All units are 11½ in. wide and 25¼ in. high. The CV7 is 30 in. long, the CV12 38 in. long, and the CV18 62 in. long.

Cooling capacities with 46° water "on" at medium speed are: for the CV7, 7,200 B.t.u. per hour; the CV12, 12,000 B.t.u. per hour; the CV18, 18,000 hourly B.t.u. Capacity for heating at 180° water "on" at medium speed is (CV7) 15,700 B.t.u., (CV12) 26,500 B.t.u., and (CV18) 39,000 B.t.u. per hour.

Air Purifier Fits Into Duct or Cooling Unit



——KEY NO. A-452——

WAUKESHA, Wis.—An air purifying unit that does its work by passing the air through an ultraviolet field, oxidizing organic matters such as smoke, gases, and odors, has been introduced by the Vita-Aire Div., Hydro Aire Corp. here.

Vita-Aire is designed to be installed in any air duct or air conditioning unit. Portable units are available for use where there are no ducts. The portable unit may be placed conveniently and plugged into any 110 a.c. outlet.

Vita-Aire also reduces bacteria, the company claims.

Hastings Air Meter Suited For Air Conditioning Use

——KEY NO. A-453——

HAMPTON, Va.—A portable anemometer, capable of giving instantaneous direct readings of air velocities as low as 5 f.p.m. and up to 6,000 f.p.m., has been introduced by Hastings Instrument Co., Inc., here.

Called the Hastings Air-Meter, the instrument operates from temperature differences rather than from direct temperature measurements. It thus eliminates effects of ambient temperature and static pressure, the company claims. The lag of the instrument is said to be less than one second.

The company says the Air-Meter is well suited for air conditioning, ventilating, and heating work, and measurement of rate of flow in gas and air systems.

The meter measures 3⅜ by 5½ by 2½ in. and weighs 24 oz. Its temperature compensating probe is ½ in. in diameter and 4⅞ in. long. It weighs 2 oz.

Carrying cases and a number of optional accessories have been designed for use with the Air-Meter for special applications. Accessories can be purchased individually, according to the particular application for which the Air-Meter is to be used.

The Air-Meter takes 90 to 135 volts, a.c., 50-60 cycles. Current rating is .011 amps, and wattage is 1.2 watts.

Price of the probe and indicator is $50. Carrying cases and accessories are extra.

King-Size Cabinet— for EXTRA-BIG PROFITS!

Kelvinator 12 CUBIC FOOT Merchandiser!

New on the scene—and already a star! It's a perfect team-mate for Kelvinator's popular 6 cubic foot KM-6! It's a real roomy, quality-built "12" at a surprisingly low cost! Holds more than 400 average-size packages of frozen foods. There's showmanship in its beautiful, illuminated superstructure that also lights the cabinet interior. And it's packed with Kelvinator extra-values: Maximum capacity in minimum floor space; 3 refrigerated dividers for safe, sure, positive food protection; open top for maximum display. Sell this cabinet as a positive business-builder for food retailers . . . and win *your* share of the rich new frozen food cabinet market!

Act now—call your Kelvinator distributor. Ask, too, about Kelvinator's KM-6 Merchandiser. It's a "Juice Center", a "Packaged Foods Center", a "Spot Special"! Kelvinator, Division of Nash-Kelvinator Corp., Detroit 32, Mich.

PROFIT TODAY...BUILD FOR TOMORROW WITH

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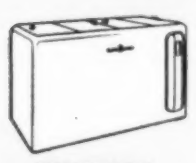
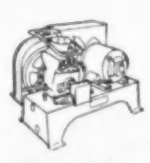

KELVINATOR BEVERAGE COOLERS


KELVINATOR CONDENSING UNITS

KELVINATOR WATER COOLERS

KELVINATOR ICE CREAM CABINETS

KELVINATOR AIR DRIER

Information Center

For *more information* on What's New products, current literature and catalogs available, equipment advertised in AIR CONDITIONING & REFRIGERATION NEWS use Key Numbers where designated or specify products advertised and we'll see that you receive this information promptly.

What's New or Current Literature Available

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AIR CONDITIONING & REFRIGERATION NEWS
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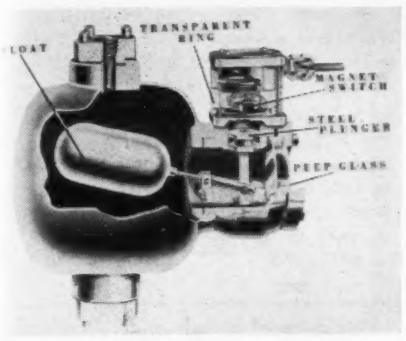
450 W. FORT ST. DETROIT 26, MICHIGAN

What's New (Cont.)



Refrigerant Float Switch Controls, Shows Level

——KEY NO. A-454——

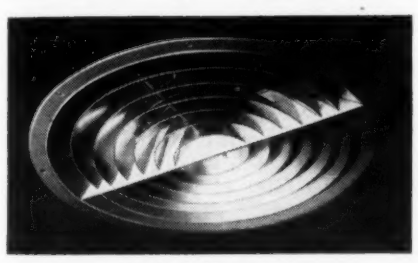
CHICAGO — Mojonnier Bros. Co. has developed a new refrigerant float switch, called the MS float switch, which will closely control the ammonia or "Freon" liquid level in evaporators and, at the same time, show the refrigerant level through a peep glass.

The switch works on a new indirect magnetic system, the company explained. A stainless steel float in the refrigerant operates a steel plunger which in turn actuates an externally mounted magnet switch. This magnet switch is housed in a transparent ring member.

This ring member, sealed off with rubber gaskets, is a pressureproof, water-tight housing, making the switch especially adaptable to operation under wet conditions and for use on sub-zero applications.

A descriptive bulletin on the switch (Bulletin 211), is available from the company on request.

High-Pressure Diffusers Offered by Anemostat



——KEY NO. A-455——

NEW YORK CITY—A new line of high-pressure, aspirating air diffusers (type HPW-1) was announced recently by Anemostat Corp. of America, here.

The new units are available in three sizes. No. 15 has a neck area of 32.81 sq. in. and is rated 80 to 170 c.f.m. primary air capacity at .5 to 2.35 wg static pressure.

No. 17½ has a neck area of 42.75 sq. in. and is rated 105 to 222 c.f.m. at .68 to 3.1 wg. No. 20 has a neck area of 60 sq. in. and is rated 145 to 312 c.f.m. at .7 to 3.2 wg.

The HPW-1 design is a pre-induction type unit which induces room air, mixes it with the primary air in approximately equal proportions, and discharges the mixture through an aspirating air diffuser.

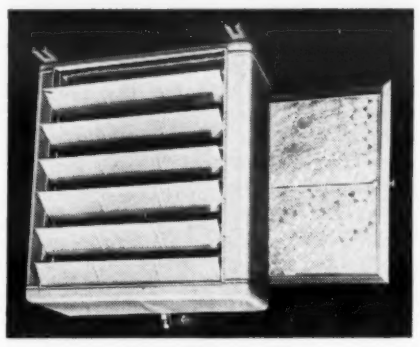
For each 100 c.f.m. of primary air, more than 200 c.f.m. of total air is discharged by the unit due to the effects of induction and aspiration.

The new units can be used on air distribution systems which carry air at velocities up to 5,000 f.p.m. and static pressures up to 6 in. wg. High temperature differentials (up to 30° F.) can be handled and temperature difference between primary air and ambient of room air is limited by dewpoint to avoid condensation.

Air volume can be manually or automatically controlled. Control valve and sound trap are capable of attenuating duct noise from 90 decibels on the high pressure side to 40 decibels on the low pressure side at a background level of 30 decibels.

Maximum resistance through valve, induction jets, sound trap, pre-induction chamber and, aspirating air diffuser does not exceed ¾ in. to 1-in. water gage for 1:1 ratio.

Kramer Comfort Cooler Includes Air Filter



——KEY NO. A-456——

TRENTON, N. J. — The Kramer Trenton Co. has announced the development of a new ceiling type comfort cooler claiming the lowest installed cost per ton of refrigeration.

The Kramer Comfort Cooler is now the only unit of its type using a filter, the company said. Previously, comfort coolers of this type have been available only without air filtering.

The filter used in the Kramer comfort cooler is of standard size and of the throw-away type. It keeps the coil completely free of all dust and grease accumulation.

The comfort cooler is mounted in the conditioned area, while the compressor can be installed in the cellar or any other remote location. Since the unit is ceiling mounted, it requires no floor or wall space.

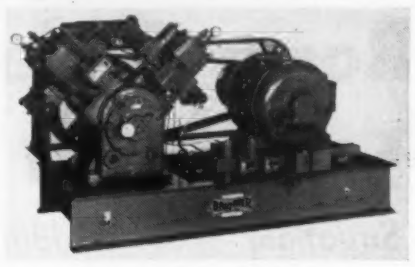
The Kramer unit requires no ducting and can be located to cover specific areas. By the use of more than one unit, it is possible to cover areas that are L-shaped and other unusually shaped areas, without the use of ducting. Adjustable louvers cover the complete discharge of the unit and direct the air stream.

A careful study was made to reduce the noise level to a minimum. Special low-speed motors are used. The motor is rubber-mounted to eliminate any vibrations. Unusually quiet fans are used. Since the compressor is in a remote position, the compressor noises are completely eliminated.

The Kramer comfort cooler has a nominal capacity of 2.6 tons and can be used with a 2 or 3-hp. compressor. For larger capacities, a number of comfort coolers can be used with a single compressor.

When the unit is used in meat cutting and package rooms, the filter solves the problem of keeping the coils clear. Direct drafts are eliminated since the unit has a low discharge velocity and the discharge air can be directed by adjustable louvers covering the full face of the unit.

It has a capacity of 17,000 B.t.u./hr. with entering air of 70° d.b. and 70% relative humidity with 30° refrigerator temperature.



Brunner's 40-Hp. Compressor.

Brunner Mfg. Introduces 40-Hp. Compressor

——KEY NO. A-457——

UTICA, N. Y. — To fill the gap between the 30-hp. unit and the 75-hp. unit introduced last year, Brunner Mfg. Co. here has announced a new 40-hp. compressor designed for refrigeration and air conditioning service.

The compressor, labeled the R-40,000, is assembled at the factory either as a motor compressor (E-40,000) or as a complete water-cooled condensing unit (W-40,000).

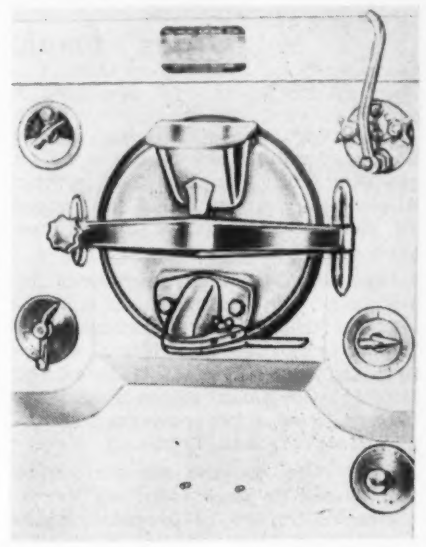
It is pressure lubricated and protected by a device which automatically stops the compressor in the event of an oil pressure failure.

It is also equipped with a high pressure cut-out which, when properly wired into the control circuit, automatically stops the compressor when the pressure exceeds 175 p.s.i. It can be equipped for unloaded start and the same mechanism will afford four steps of capacity control.

The new compressor has four 90° V-type cylinders, two to a block with the blocks bolted to the crankcase. Bore is 4¼ in. and stroke is 5 in.

Pistons are of high grade cast iron, as are the crankcase and crankshaft. The crankshaft is supported by two bronze bearings pressed into the bearing supports. Connecting rods are said to be of malleable iron with a bronze insert bearing at pin end.

The W-40,000 condensing unit weighs 660 lbs. and has an over-all length of 7 ft., 7 in. Pumped down capacity is 243 lbs. Shell diameter is 12¾ in. The 92 tubes extend 623 linear feet. Water connections are 2 and 2½ in.



Mills Develops Sanitary Custard Draw-Off Spigot

——KEY NO. A-458——

CHICAGO—A new sanitary draw-off soft products spigot has been developed for custard, iced milks, frosted malts, etc., by Mills Industries, Inc. here.

It will be available on 1951 Mills combination continuous custard and batch ice cream freezers, governed of course by the present emergency rulings on materials.

A short traverse, each pull handle opens the spigot and feeds frozen custards directly into the custard cup.

half-a-horse SAVES

to increase profit margins

It takes less power to run the ½ HP unit in a Sherer 6 ft. refrigerated display case, than it takes to run the usual ¾ to 1½ HP required in most cases of this size. This is just one of the many savings made by the new and exclusive Sherer ATOMIZED AIR—DIRECTIONAL FLOW refrigeration principle. This proved feature also permits the recirculation of chilled air, instead of continually drawing-in a new supply of warm air. This reduces running time as much as 15% and means substantial savings for you in electric power bills.

In addition, the gentle flow of ATOMIZED, conditioned air in Sherer cases, keeps displays looking their best always—keeps merchandise more atttractive to create the extra impulse sales that build up your volume. The savings in power, plus the increased **sales, simply add-up to greater** profits with Sherer.

MODEL 2410CS

Write today for complete information on the full line of sales stimulating Sherer Refrigerated Display Cases.

SHERER

SHERER-GILLETT COMPANY
Dept. AC MARSHALL, MICHIGAN

If you want to put the advantages of these new Sherer developments to work for you
WRITE FOR FRANCHISE INFORMATION
Name .....
Address .....
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. . . FILTRINE "Taste-Master" Demineralizer in the water line

Cuts Service
No Tastes
Clear Ice
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Small Cost

Crystal ice . . . without sludge-forming rust, sediment, mineral residue . . . chlorine taste . . . "milkiness." Ends major source of service calls. Write for new literature.

Filtrine HIGH EFFICIENCY
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BROOKLYN 5, N. Y.

Where One Room Cooler Is Used --Another Is Probably Needed

Laube Explains Situations Where Additional One Can Be Placed; Urges Emphasis on Unit's 'Extra' Functions Beyond Cooling

By Herbert L. Laube, President, Remington Corp.

Here's the core of the methods advanced by Mr. Laube for developing "multiple" sales of room air conditioners, and for answering objections in the field:

" . . . practically all prospects for the sale of a room cooler are candidates for the purchase of three or more such units. A doctor who buys a couple of units for his office needs a couple of more in his home. The shop foreman who buys one for his bedroom needs one for his living room. . . ."

" . . . Many of the objections which keep people from becoming repeat buyers can readily be answered by salesmen if they are properly equipped. Such objections as 'the unit blows a fuse and stops running on really hot days' or 'we use it for only a few days each summer' or 'we are just as comfortable with the windows open.' can be met with the use of a voltmeter, a balloon, and a easy-to-use selector that will assure a unit of proper capacity being installed. . . ."

The room air conditioner has a unique attribute not to be found in any other major appliance. It is this: A prospect who buys his first room air conditioner is *still* a prospect for *more* room air conditioners.

Generally speaking, a prospect for one room air conditioner is a prospect for three room air conditioners. In short, he may look like a singleton, but he is, in fact, a set of triplets! So much so, in fact, that I have titled these remarks: "Making Prospects into Triplets."

Merely to list the occupations of just a few typical room air conditioner customers is to demonstrate that all of them are prospects for more than one unit. For example:

1. **The Doctor or Denist:** Should have four units as a minimum; one each for the waiting and work rooms at the office, and one each for his bedroom and living room at home.

2. **The Lawyer or Public Accountant:** Needs at least three units: Office, bedroom, and living room.

3. **The Business Executive:** Needs at least three units, as above.

4. **Shop Worker or Foreman:** Needs one unit in his bedroom for a good night's rest—even more necessary if he's on the night shift and sleeps during the heat of the day—plus one unit in his living room, so he and his family can enjoy their heat-generating TV set in summer as well as winter.

5. **Teacher or Preacher:** Like the businessman, he needs three units for his study, bedroom, and living room and possibly others as well.

In none of these examples have I mentioned the average of some two-plus children per American home. They, too, want air conditioning!

Now you see why I say that a prospect for one room air conditioner should, in most cases, be a prospect for three. He may look like a singleton but he is, in fact, a set of triplets.

Those of us in the sales end know, unfortunately, that many of the folks who buy one unit and who, unquestionably, have the need and the money for more, do not promptly become repeat buyers. Actually, some of them never buy again. There are many possible reasons why such one-unit buyers do not always become repeat buyers within a reasonable time after the first unit is installed. Some of these reasons have probably come to the attention of all of us:

1. The unit is considered to be too noisy.
2. It is too difficult to install the unit in casement windows.
3. "It blows fuses, blinks lights, and stops running on really hot days."
4. "We use it for only a few days each summer."
5. "We are just as comfortable with the windows open as with the unit running."

How Problems Can Be Solved

Of these five reasons the first two—noisy operation and difficulty of installing in casement windows—are problems to be solved in his laboratory by the factory design engineer, and are not within the scope of these remarks. The other three, however, are field problems—problems either created or avoided by the actions of the dealer, his salesman, or his distributor. They are the responsibility of whoever makes the retail sale, whoever selects the unit for capacity, and whoever is responsible for completing the installation.

These three field-made reasons, in less informal language are:

a. Inadequate electrical supply.
b. Limited usage.
c. Insufficient cooling power.

Each one of these reasons, or any combination of them, has caused many a user, who still had both the need and the money for more air conditioning, to decide that he just didn't want another room type unit. These dissatisfied users are the people who should be of special interest to us. If too many of them are created the room air conditioner business will never amount to much. But if we can conduct our business so as to gradually eliminate users who are dissatisfied for the reasons cited, then the future growth of our industry will be even more spectacular than it has been in the past.

Parenthetically, just how rapid has this growth been? Here are the post-war figures:

Year	No. of Units Sold at Retail	Increase, %
1946	27,000	....
1947	41,000	52%
1948	67,000	63%
1949	100,000	50%
1950	175,000	75%
1951 (est.)	290,000	66%

But let's get back to the field-made obstacles which, if not corrected, may seriously impede the potential rate of growth of our booming infant industry. Let's get back to the user, who has one air conditioner but is not buying more because, on the hottest days when he needs it most, the compressor motor is stopped by the overload device. In the case of properly designed units this only happens, in most cases, when the voltage of the machine is inadequate for proper operation.

The Question of Low Voltages

This low voltage, in turn, is generally due to connecting the unit to an existing 115-volt loaded circuit where a new circuit—possibly of 230 volts instead of 115 volts—is required.

The remedy for this condition appears to be made up of three elements:

1. Proper education of the retail sales force.
2. Frank dealing with the prospective customer.
3. The use of a voltage checking device *before* the unit is installed.

Voltage checking devices that are easy to carry and simple to use have been available to air conditioning dealers for some years. Such devices are usually offered for use on 115-volt circuits only since, when an air conditioner is to be connected to a 230-volt circuit, the circuit is less apt to be overloaded or undersized.

A voltage checker generally consists of a voltmeter, a phantom load, and a push-button switch mounted in a handy carrying case, fitted with a 6-ft. cord and plug. In the case there is usually a chart showing acceptable voltage readings for various sizes of units.

The use of the voltage checker is extremely quick and easy. At the time of day when line voltage is apt to be lowest—mid-afternoon in an office, early evening at home—the voltage checker is plugged into the outlet to which it is intended to connect the air conditioner. The no-load voltage is then indicated on the voltmeter, and noted. Thereafter, the push-button switch is pressed. This imposes the phantom load on the circuit and a reduction in voltage results. The amount of this reduction is the key to how large a unit—if any—may be successfully connected to the circuit.

The conscientious use of voltage checkers by all organizations engaged in the retail sale of room air conditioners is vital if our industry is to capitalize on its unique opportunity of selling additional air conditioners to the man who already owns one.

The second of our field-made reasons for not buying a second or third unit usually goes like this: "We use it for only a few days each summer." How, you may ask, can the salesman be at fault for this condition. The salesman's responsibility, it seems to me, is determined by the extent to which he has failed to sell his customer on *all* of the benefits and *all* of the functions of the air conditioning unit.

In short, how well was the salesman trained by the dealer by whom he is employed? And how well was the dealer trained by the distributor and the distributor by the factory?

The entire marketing chain which, in the case of over 90% of all units sold is from the factory to the distributor, to the dealer, to the user, knows that a room air conditioner is designed to provide comfort by "keeping you cool when it's hot" and that this comfort enhances the personal efficiency of those who work in an air conditioned environment.

But the third and greatest benefit provided by a room air conditioner—its promise of better health through better air throughout the year—is only vaguely understood and unconvincingly sold.

It is not my purpose to go into a physiological discussion or to be the fool who steps in where the competent angels of the medical profession hesitate to tread. Instead, I merely want to suggest that our industry can and should make much better use than it has so far of facts that are known to it. Properly dramatized, these facts can do much to make his room air conditioner a much more valuable appliance to both the present and the prospective user.

It seems that the dramatizations to which I refer may lend themselves especially to group meetings—whether of wholesale or retail salesmen or prospective buyers, such as are encountered at luncheon clubs, clubs of men or women, fraternal and church groups, and the like. It is probable that some of them could also be used to advantage before the individual prospect.

Dramatize What Unit Does

Four rough suggestions which in the hands of a skilled showman, might be made to be rather effective include:

1. Two 60-watt electric bulbs used to demonstrate the amount of heat given off by an average person at rest—400 B.t.u./hr. One bulb, immersed in water, would represent latent heat, the other, in air, sensible heat. The importance of getting rid of this heat and difficulty of doing it should be stressed.

2. As you know, the human stomach takes food and drink perhaps five times every day. But the lungs take air 15 times a minute, 900 times an hour or 21,600 per day. Thus, for every meal we eat or snack we gulp, we inhale 4,320 times. Yet the care we take to have pure food and drink is in marked contrast to our careless attitude toward the air we breathe. Possibly that it why illnesses of the respiratory tract are more prevalent than all other illnesses combined. At any rate, these facts are just begging to be dramatized.

3. The weight of food and drink taken into the body every day is about 7 lbs.—less than a gallon in volume. Yet man's daily diet of air is 34 lbs. which, at ordinary room temperature, is 459 cu. ft. or 3,442 gals. This would fill a balloon, 9 ft. 7 in. in diameter. Certainly that fact offers possibilities for dramatizing the importance, to each of us, of the air we breathe.

4. The pay-off in dramatic possibilities may be the fact, as determined by tests conducted several years ago that every year the average man in a large city draws into his body with the air he breathes, some 24 ozs. of the foullest, germ-laden filth imaginable. It would make

(Concluded on next page)

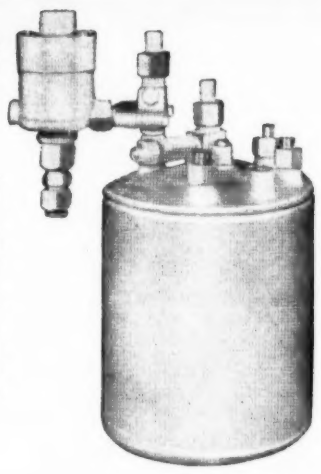
INSTANTANEOUS . . .

TEMPRITE

WATER COOLERS
BEVERAGE COOLERS
CARBONATORS
ACCESSORIES

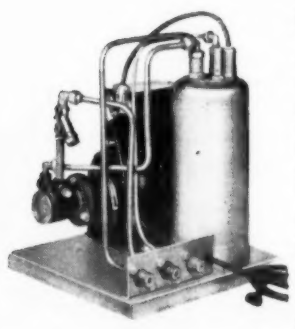
WATER & BEVERAGE COOLERS

Compact Temprite water coolers operate on patented *instantaneous cooling principle.* There's a Temprite model for the smallest to the largest commercial or industrial application. *Adaptable for use with carbonated beverages and many other special liquids.* Constructed entirely of non-corrosive materials.



BEER COOLERS

Actually cool up to 3 kinds of beer plus carbonated water and plain water in the same cooler at the same time. Patented control maintains perfect drinking temperature under heaviest loads and protects against needless draught beer waste. All stainless steel coils are easy to keep clean and high tensile strength offers safety and permanency. Beer coolers are obtainable with or without the outside water and soda water cooling coils if desired.



CARBONATORS

Temprite Automatic Carbonators will deliver as many as 6450 glasses of highly carbonated water from a single 20 lb. tank of CO^2 gas. No loss of CO^2 gas through purges or vents. Gives peak carbonation at lowest CO^2 gas pressure.

Shown is the completely self-contained packaged unit. Temprite Carbonators are also available for remote installation of the pump, motor and relay assembly; and a Cooler-Carbonator assembly is offered which will cool and carbonate water at the rate of 300 glasses per hour, at a constant 40 degree temperature.

EQUALIZER TANKS

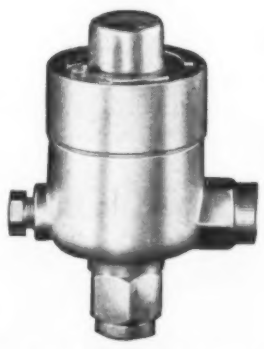
Prevents short cycling of condensing unit and permits temporary overloading of cooler without passing load directly on to compressor. Recommended in all Temprite installations except in large duplex systems. Made of cold rolled steel, electrically welded, pickled and neutralized; thoroughly cleaned and dehydrated. Aluminum finish. Approved by Underwriters.

TWO-TEMPERATURE VALVES

Provide a wide range of adjustments and close temperature control. Essential to the multiple type refrigeration system, the Temprite 2-Temperature valve is also used on single applications where closer and more constant regulation is required than can be furnished by the condensing unit control switch.

Of the throttling type, these valves begin to close as the cooling unit approaches its required low temperature. The amount of refrigeration is thereby reduced, and all cooling units in the system reach their cut-out point about the same time, thus maintaining a better balance in the system.

Five models are available for use with Freon, SO_2 or Methyl Chloride refrigerant in capacities up to 250,000 B.T.U. Rugged construction, accurate control, and low pressure drop across the valve insure long life, satisfactory operation.



OIL SEPARATORS

In capacities from 1/6 H.P. to 50 tons; removes over 98% of oil from the refrigerant gas along with dirt, scale, core sand, etc. Keeps oil in compressor, away from condensor, expansion valve, and evaporator coils.

Permits the refrigerant to boil at its true boiling point. Heat transfer is increased up to 20%, thus evaporator temperatures from 4 to 7 degrees lower can be reached at no increase in operating time.

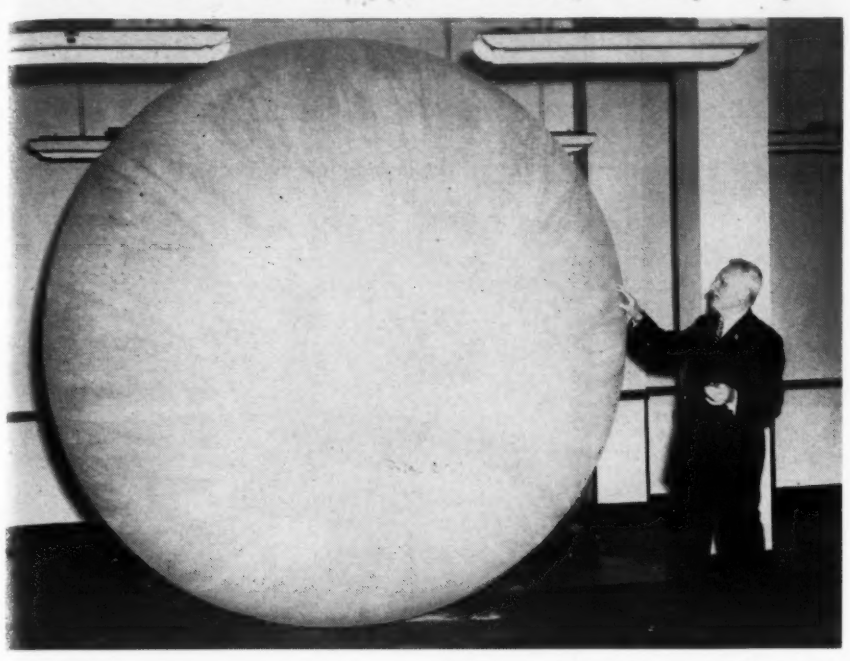
Adaptor blocks are available to facilitate installation into systems up to 5 tons. Installed between head of compressor and discharge shut-off valve. Studs, bolts and gaskets included as a complete assembly.

Distributed in Canada by Refrigeration Supplies Company Ltd., London, Ontario

TEMPRITE PRODUCTS CORP.
ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES

P. O. BOX 72-G, EAST MAPLE RD.
BIRMINGHAM, MICHIGAN

This Much Air Enters Your Lungs Every Day



YOU BREATHE DAILY 457 cu. ft. of air, the amount of air which this balloon holds entering the lungs of a person every 24 hours. At normal room conditions this air weighs 34 lbs. The importance, from a health standpoint, of keeping it pure and clean is obvious. With the balloon is Herbert L. Laube, president of Remington Corp., who used a similar balloon to make a point during his talk (reported in these columns) before the New York section of the American Society of Refrigerating Engineers.

* * *

Selecting Proper Size Unit Is Important--

(Concluded from preceding page)

you gag to listen to an analysis of just what this filth contains.

It is not intended to imply that man can escape, entirely, from the hazards implied by the opportunities for dramatization just related. But he can and should do more than he has toward minimizing them. And, if the present user of a room air conditioner can really be made to understand how much besides cooling it will do for him, he will no longer say, "We use it only a few days each summer," because he will then operate it as the year-round appliance that it really is.

Some members of our industry feel that the most frequent single reason why one-unit buyers do not become repeat buyers is that the customer "is just as comfortable with the windows open as with the unit running." In short, the unit has insufficient cooling power to eliminate discomfort from the room in which it has been installed. To the average buyer the cost of a room air conditioner seems so high that it is easy to see why he is unhappy when his unit is too small to provide comfort.

At the outset of these remarks, mention was made of the unique attribute of the room air conditioner which gives it a sales advantage over all other major appliances—the happy fact that a prospect for one is really a prospect for three. Saleswise, however, the room air conditioner also has a unique fault, or weakness.

It is the *only* major appliance the success of which in the hands of the user is always determined by a factor over which the manufacturer has no control. What I refer to is the actual capacity of the unit vs. the capacity required to provide comfort in a certain room.

What corresponds to capacity in a room air conditioner is, in other major appliances, an inherent characteristic capable of giving user satisfaction without regard to external factors. No user expects a 6-cu. ft. refrigerator to store 10 cu. ft. of food.

No housewife expects a 7-lb. home laundry to accommodate a 15-lb. batch of dirty clothes. Nor is it customary to expect a 20-in. picture from a 10½-in. television tube. But the number of people who seem to expect a half-ton air conditioner to handle a 1-ton load is legion.

When the Unit Is Too Small

True, some prospects insist on buying a unit too small for their needs, even after a careful B.t.u. estimate has been made and presented by the salesman. The prospect who knowingly and deliberately buys an undersized unit justifies his action by saying:

"I just want a little cooling."

Translated, this means: "I don't want to pay the price of a unit large enough for my needs." And forever after he blames his hot weather discomfort on the poor undersized unit and the man who sold it to him.

We like to blame the customer for his folly in buying an undersized unit. There are, however, entirely too many cases where the sales force is really to blame, assuming it is fair to blame the sales force for not doing properly that which they are really not yet competent to do, which it isn't.

What I mean to say is this: The non-technical salesman of a non-technical appliance distributor sells units to a non-technical appliance dealer who depends for their sale on people to whom a monkey wrench is an intricate and complex mechanical device. It's no wonder some of our customers have reason to complain. But it's not good, and what are we going to do about it?

We engineers can, of course, look condescendingly down on the sales people and say: "It's your own fault. You should teach your field salesmen how to make a B.t.u. estimate, so they can teach the distributors' men who, in turn, will teach the dealer and his men—and they will protect the prospect."

We engineers can point out that we've done our duty. Working through the ACRMA we have developed a very simple B.t.u. estimate form. Any high school graduate with a little coaching on the side shouldn't need over an hour to complete one of these forms.

"Why," we may ask, "doesn't the salesman use it?"

Making Calculations Simple

However we answer this question, it's a fact that the average appliance dealer is frightened by even the most simple B.t.u. estimating form. Instead, he depends on rule-of-thumb—and uses a thumb that doesn't know a B.t.u. from a decibel. Yet we want to build up this room air conditioner business; to do it requires commercially acceptable application practice that can and will be used, *safely*, by the average appliance store. The development of such a practice is *not* a sales problem for engineers who have enough imagination to work it out.

During the last few years a number of attempts have been made to develop a safe yet quick and simple application method or device. One was brought out, in the form of a slide rule, by the Fedders organization. Another was developed by Philco. In my judgment these devices are both commendable steps in the right direction. However, it seemed practicable to produce something even more simple and rapid to use, and that would still be safe.

The new device referred to is called the Remington Automatic Direct-Reading Comfort Selector. On one handy pocket-size disc calculator appear 720 different room air conditioner selections, of which 36 are revealed for each of 20 settings of the device. To make it reasonably safe for use, this Comfort Selector takes cognizance of the following important variables:

1. Room size in square feet of floor area, from 100 to 620 sq. ft.
2. Wall construction, whether light or heavy.
3. Heat gain through the ceiling.
4. The proportion of outside wall area that is glass.
5. Whether the room is to be occupied in the daytime or just at night.
6. The exposure to the sun of the walls of the room to be conditioned—all likely exposures being combined into six groups.

Using the Comfort Selector

The Selector is designed for use in the northern hemisphere, within the limits of latitude occupied by the U. S. A. Certain design factors, such as ceiling heights, room proportions and ventilating air are taken care of on the basis of average values. Generally encountered figures for room occupancy are likewise employed.

To use the Comfort Selector it is merely necessary to note the floor area of the room and whether it is of heavy or light construction. The disc is then turned to the square foot value closest to that of the room to be conditioned.

After this has been done the ratio of outside window area to outside wall area is estimated. The disc reveals two ratios—20% and 40% for each floor area. The disc is set for whichever of these two ratios is closest to the value estimated. No further adjusting of the disc is required.

Once the disc has been set the correct model of air conditioner to be used appears directly in one of 18 windows. The proper window to use is determined by the room exposure, ceiling heat gain, and whether the room is for day or night occupancy.

While this particular Comfort Selector is designed for the selection of Remington units only, it is obvious that it can easily be re-calibrated for any other line of room air conditioners.

To summarize what has been said: A man who buys one room air conditioner is usually still a prospect for two more—provided he is entirely happy with the first one. Many one-unit users are, however, not sufficiently pleased to buy the extra units they need and can afford.

Their complaints can be solved, and the growth of our industry protected by improved design of units and improved field practices. The improved field practices proposed are the general use of voltage testers to prevent unit becoming inoperative due to low voltage; the dramatization of the year-round health benefits of the room air conditioner as a means of enhancing its value in the mind of the user; and the simplification of safe selection methods to the point where the most non-technical salesman will use such a method in preference to rule-of-thumb.

The job of putting over this program of reducing field-created complaints may seem to belong to the salesmen of our industry. But actually it doesn't. It belongs, first, to those engineers who have the technical skill to know what should and can be done plus the sales appreciation and imagination to package their ideas in a form acceptable to the field sales organizations.

a good tip for wise refrigeration men:

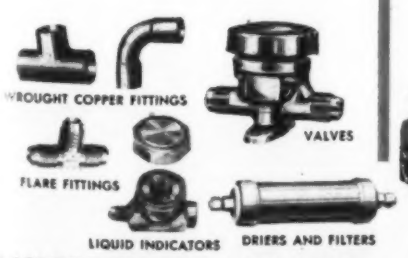
Always use dependable quality built MUELLER BRASS CO. parts.

8 good reasons why it pays to stock, specify and install Mueller Brass Co. STREAMLINE Globe Type Valves.

- No bolts—no flanges—no gaskets.
- New design eliminates excessive weight.
- Can be disassembled and ready to solder into the line in 10 seconds.
- Stem of corrosion resistant aluminum bronze.
- Highly polished red bronze body.
- Sizes ⅛" to 4⅛" O.D. Order from your refrigeration wholesaler.
- Positive shut-off always assured with the amazing nylon stem seating disc.
- "O" ring provides a permanent, positive seal against any loss of refrigerant.

60-A

Have these STREAMLINE products on hand for every job where you want dependable performance.



Write for catalog R-151 describing complete line of STREAMLINE refrigeration products.

STREAMLINE refrigeration products are individual and multiple packaged for complete protection.

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Fast, dependable, world-wide service.

Refrigeration and Air Conditioning parts and supplies.

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AIRO SUPPLY CO.
2732 N. Ashland Ave., Chicago 14, Ill.

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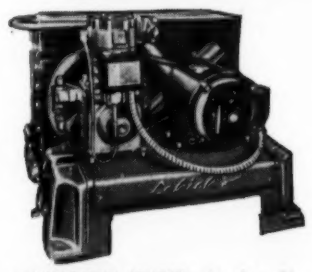
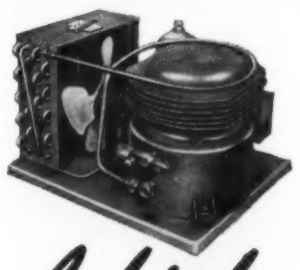


PACKAGED UNITS—¼ thru ½ HP (F-12 and F-22)

HEAVY DUTY — Air Cooled — Water Cooled — Combination Air-Water — ⅓ thru 7½ HP

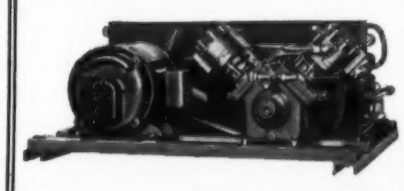
New Lehigh **HERMETICS** — Low Torque and Capacitor — ¼ thru ½ HP

*Automatic HIGH-SIDE DEFROST UNITS — ½ thru 3 HP



THE UNITS YOU NEED TO KEEP THE WHEELS TURNING!

Sales for you—service for the user. Ratings that you can guarantee — quality that turns cold demands into warm friendships. And don't forget that those new Lehigh HERMETICS open up many new markets for you!



. . . for body builders

TRUCK UNITS

The LEHIGH TEAM spent five years analyzing truck requirements and has come up with the finest equipment on the market for this purpose. These units are rugged, compact and flexible. We can help you close these good business prospects!

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Lehigh Manufacturing Co. Plant: LANCASTER, PENNA.

Export Department—39 Broadway, New York 6, N. Y.

H. Blake Thomas Joins McQuay Board of Directors

MINNEAPOLIS—H. Blake Thomas, vice president in charge of sales, McQuay, Inc., has been elected to the board of directors, R. J. Resch, president and chairman of the board, announced.

All other members of the board were re-elected at the company's recent annual meeting.

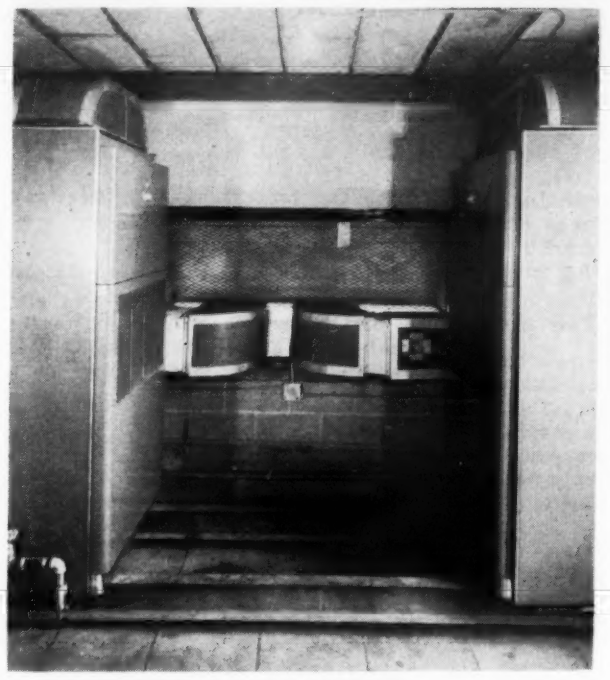
Thomas' association with the company dates back to 1930. He served successively as assistant sales manager and general sales manager before his appointment as vice president Jan. 1, 1948.

He represents McQuay with the Industrial Unit Heater Association, is a director of Refrigeration Equipment Manufacturers Association, and served the Blast Coil Manufacturers' Institute last year as vice president.

He is a member of the extended surface heating equipment advisory committee of the National Production Authority and recently was appointed to serve on a task group of the commercial refrigeration and air conditioning industry advisory committee of NPA.

Other directors of the company are:

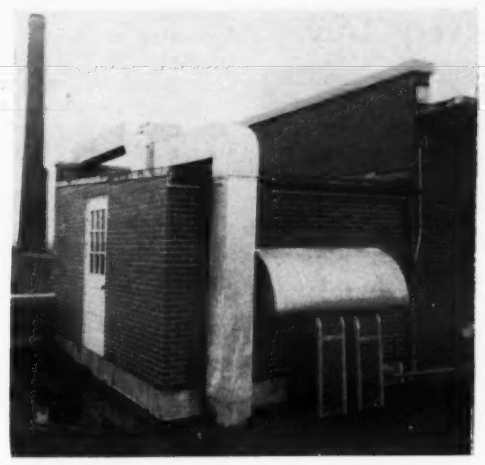
P. S. Morris, executive vice president, McQuay; E. H. Seelert, vice president and secretary-treasurer, McQuay; Milo F. Snyder, vice president, Loewi & Co., Milwaukee; R. L. Vincent, president, Vincent Brass & Copper Co., Minneapolis; F. W. Seelert, executive vice president, Northwest Machine and Tool Co., Minneapolis; and George Kelting and R. C. Colman, both retired.



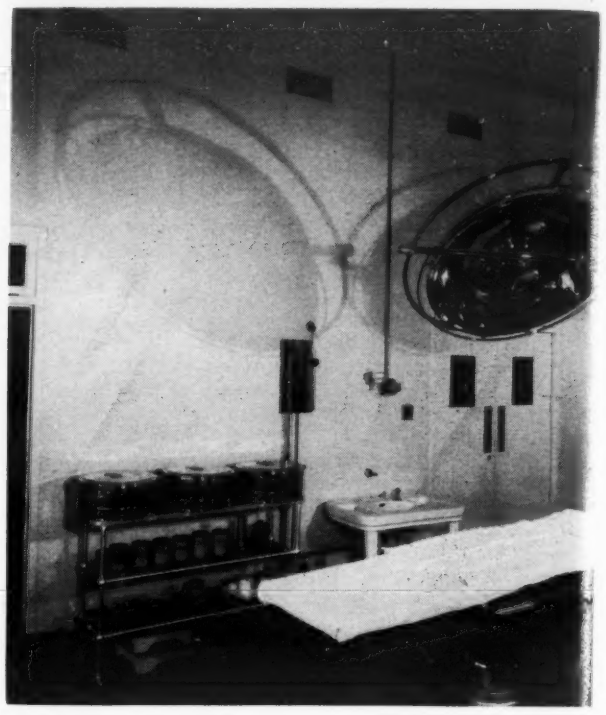
FACE-TO-FACE INSTALLATION of two Frigidaire 5-ton packaged air conditioners serving two operating rooms of the Mercy hospital, Hamilton, Ohio. They are located in a brick penthouse (center) built on the roof, over the operating rooms. Ducts leading to the conditioned area can be seen in the center of the picture.

Dealer Announces 2 Changes

NEW ORLEANS — Ernest Engineering, Inc., Carrier dealer here has moved its office to 346 Lake Ave., Southport. The company also announced that its Central American office is now under the management of Ing. Santiago M. Angulo.



ABOVE: Brick penthouse, 10 ft. wide and 16 ft. long, was built to house two 5-ton Frigidaire packaged air conditioners serving two operating rooms. It is large enough to house several additional units.



RIGHT: Three air discharge outlets near the ceiling of this operating room provide an umbrella of cool air which falls gently over the patient and operating team during surgery.

Hospital Cooling with Packaged Units

Air Conditioning Can Be Made To Fit the Budget by Adding One Unit at a Time, Yet Meet Load Requirements

By W. F. Switzer, Commercial Sales Mgr., Frigidaire Div., General Motors Corp.

New development and modern design in self-contained air conditioning units have brought about a comparatively new conception of air conditioning in hospitals and large institutions—particularly when older type existing buildings are involved. Air conditioning can be bought by the package as required.

Modern self-contained air conditioners provide all of the benefits of larger systems. Moreover, such units can be installed easily and quickly, singly or in multiple, matching the air conditioning load requirements. Because they are self-contained, of comparatively light weight and easy to install, they can be added as needed.

When the Budget Is Slim

For this reason, hospital management is finding that progressive expenditures for these self-contained units fit into nearly any type budget pattern. Adding equipment as fast as funds become available is particularly helpful when the annual budget allocation for such improvements may be too slim to bear the brunt of complete air conditioning facilities all at one time.

Mercy hospital, Hamilton, Ohio, has such a packaged air conditioning program under way. The hospital contracted with Allied Refrigeration Co., Frigidaire commercial dealer, to air condition its two operating rooms with packaged units—with more to follow.

Mercy hospital is a modern 300-bed institution, equipped with two operating rooms for major surgery. Between 350 and 400 operations are performed in the hospital each month. The operating rooms are located on the fourth and top floor of the hospital.

Allied Refrigeration company designed a brick penthouse 10 ft. wide by 16 ft. long on the hospital roof, directly over the operating rooms. Two 5-ton self-contained Frigidaire air conditioners were installed face to face in this penthouse.

Diversified Airflow Possible

Supply ducts were installed from the air conditioners to the operating rooms below. With one unit serving each room, a highly diversified airflow is possible. The operating rooms are separated by a sterilizing room, where the exhaust system is installed. There is an 18-in. anemostat located in the ceiling of this room. The exhaust system may be operated independently from the air conditioning equipment. This is particularly important during winter months because fumes from the operating rooms can be exhausted.

Air conditioning an operating room is somewhat different from the average installation because 100% fresh air must be cooled and introduced. The separate exhaust system becomes necessary in disposing of the anesthetic-laden air. Moreover, anesthetic fumes create a dangerous hazard and for this reason, explosion-proof automatic controls were employed.

In installing the Frigidaire air conditioners it was necessary to reduce the rate of air delivery of the units. These conditioners are designed to deliver up to 2,000 c.f.m., which is excessive for operating rooms of the type in Mercy hospital.

The fan motors of the units were set at the lowest position and a manual damper was installed in each, located in the supply ducts near the conditioners. Thus, air delivery of each air conditioner was reduced to approximately 800 c.f.m., totaling 1,600 c.f.m.

The explosionproof exhaust system carries air out of the conditioned area at a rate of about 1,400 c.f.m., keeping the operating rooms under a slight static pressure. Cool, filtered, fresh, dehumidified air is introduced into each operating room through three discharge outlets, located along inner walls, about 12 ft. above floor level.

An "umbrella" of cool, clean air covers the upper part of the operating rooms falling gently over the patient and operating team of doctors and nurses. Such a system reduces the possibility of harmful drafts.

Eases Strain for Surgeons

Air conditioning provides numerous advantages for the hospital. It has been pointed out that prior to installation of air conditioning, Mercy hospital surgeons had been "operating under a terrific strain," with temperatures running up 95° and higher.

Because of excessive heat and humidity there were occasions when an operating team nurse was required solely to keep the attending surgeon's face wiped free of perspiration. Needless to say, high temperatures amplified the strain, particularly during delicate operations such as brain surgery.

Can Operate at Convenience

Prior to installing the air conditioning system the hospital attempted to schedule surgery during the cooler morning hours whenever possible to help its surgeons. Now operations can be scheduled throughout the day and during the evenings at the convenience of all concerned.

It is reported that the air conditioning system benefits the patients as well as the surgical staff. Attendants say that the patient does not lose body fluids as fast as before—an important factor when surgery is required. Then too, modern asepsis, which necessarily is predicated upon cleanliness, becomes difficult in areas not air conditioned. Because incoming air is filtered and cleaned by the air conditioning units, more sterile conditions are provided.

Installed Without Interrupting Schedule

The system provides constant temperatures at all times. It is set for 74° F. with 65% r.h. Hospital officials pointed out that the Frigidaire packaged unit system was installed without interrupting the heavy operating schedule.

In order to save on expenses in the future when the system is enlarged, the penthouse on the roof was built of sufficient size to house several more packaged units, providing adequate refrigeration capacity to air condition the entire operating wing, consisting of 16 separate rooms and a central hall.

One Third Estimated Cost of Central System

It is interesting to note that the initial air conditioning project was completed for less than $10,000, including the cost of construction of the brick penthouse, ducts, wiring, plumbing, and the two 5-ton packaged units. Estimates for air conditioning the entire suite, including the operating rooms and the 16 others with a central system equipment, ranged as high as $35,000—a sizeable amount for any budget. In addition, daily operating costs are lower for the packaged units.

Mercy hospital officials found that they could have air conditioning where it was needed most—in the operating rooms—and later expand the system to include the remainder of the wing by installing packaged equipment. The system can be enlarged as fast as budget allocations will permit.

"READY FOR ACTIVE DUTY"

A report to Defense Contractors from Governair!

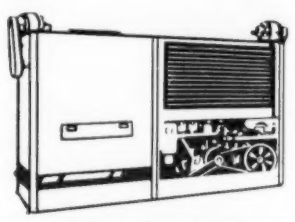
During World War II GOVERNAIR Air Conditioning and Refrigeration products proved their value to the Army and Navy.

And in the years that followed, both industry and business have found that Governair products are invaluable tools of production.

In this present crisis, Governair men and machines stand ready to do their part in the defense effort.

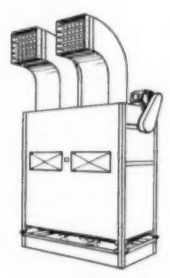
On any defense job where you need Air Conditioners, Evaporative Condensers, Cooling Towers, Unit Coolers or Blast Coils that are designed and built to the specifications of ASA, ASRE, NAFM, NEMA, ASHVE—select *approved* GOVERNAIR products!

Governair is ready for *immediate active duty!*

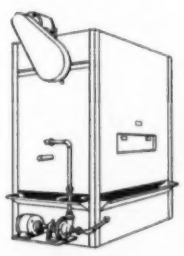


COMPLETELY PACKAGED AIR CONDITIONERS

AIR CONDITIONERS

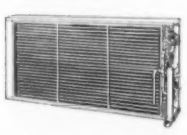


UNIT COOLERS



EVAPORATIVE CONDENSERS

COOLING TOWERS



BLAST COILS FOR HEATING & COOLING

IMPORTANT DEFENSE USES FOR GOVERNAIR PRODUCTS!

There are hundreds and hundreds of important uses for Governair Air Conditioning and Refrigeration products. You can find an application for them in every important phase of defense work. These are only some of the uses where Governair products meet defense requirements. In addition to airplane engine factories, electronic equipment plants and similar defense facilities, Governair products are especially adaptable for use at Naval and Marine Ship and Shore Installations, Army Posts and Air Force Bases as listed below.

- Convalescent Wards
- Operating Rooms
- Processing Precision Instruments
- Food Freezing
- Parachute Drying & Storage
- Bombsight Storage & Repair
- Storage of Finely Tooled Parts
- Storage of Perishable Foods
- Storage of Tools and Dies
- Storage and Repair of Radio and Radar Equipment

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ANY QUANTITIES • MUST BE NEW
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Contractor's Inspection Service Form Protects Firm When Customer Claims Servicemen 'Never Stop'

REFRIGERATION
AND/OR
AIR CONDITIONING
INSPECTION SERVICE

NUMBER_____ DATE_____

NAME_____

ADDRESS_____

MODEL_____ MOTOR_____ MAKE_____

INDICATE SERVICES PERFORMED WITH CHECK MARK

- ☐ 1. Inspect equipment for refrigerant leaks.
- ☐ 2. Repair all leaks in refrigerant mains.
- ☐ 3. Clean condenser once a year on water-cooled systems.
- ☐ 4. Clean lint and dirt from air-cooled condensers.
- ☐ 5. Clean all strainers.
- ☐ 6. Adjust tension on all belts.
- ☐ 7. Lubricate all moving parts.
- ☐ 8. Check operating pressures of condensing units.
- ☐ 9. Purge air from systems.
- ☐ 10. Check refrigerant in systems.
- ☐ 11. Charge refrigerant into systems as necessary.
- ☐ 12. Inspect and adjust temperature controls.
- ☐ 13. Inspect and adjust safety controls.
- ☐ 14. Inspect and adjust all valves.
- ☐ 15. Adjust water regulating valves.
- ☐ 16. Check operation of refrigerant controls.
- ☐ 17. Inspect oil in compressor and replenish with oil if necessary.

TIME REQUIRED_____ SIGNED_____

SERVICE MANAGER_____

REMARKS AND/OR RECOMMENDED REPAIRS IF ANY REQUIRED:

ENGINEERS
CONTRACTORS
MAINTENANCE

RADOE
REFRIGERATION CO.
8328 WEST VERNOR HIGHWAY
DETROIT 9, MICHIGAN
VINEWOOD 1-1300

REFRIGERATION
AIR CONDITIONING
HEATING

NIGHTS, SUNDAYS & HOLIDAYS
WOODWARD 3-6917

DETROIT—Maintenance contracts, which have been successfully used by contractors in various parts of the country for some years, have an inherent drawback, according to Lou Radoe, who operates Radoe Refrigeration Co., Curtis distributorship here.

"One difficulty is that some of the owners of refrigeration and air conditioning equipment who benefit by periodic inspections under the maintenance agreement will claim that the servicemen never stop in to make the inspections called for by the contract. What usually happened was that the owner wasn't around when the inspection was made.

"We used to get such complaints from some customers, and even though we knew the equipment had been inspected as per the agreement, it was hard to convince them that we had performed our duties.

'Just Collecting Money . . . Without Doing Any Work'

"Such customers would say we were just collecting money from them without doing any work," Radoe declared.

This is generally apt to be the case when service troubles arise on refrigeration or air conditioning equipment covered by a maintenance contract. While periodic inspection and maintenance will minimize service calls and improve operating efficiency of such equipment, obviously it cannot prevent all service difficulties. Some develop as the result of misuse by the owner or due to other circumstances beyond the control of the contractor.

"What we worked out," explains Radoe, "is a report form which the serviceman makes out in duplicate as soon as he completes the inspection on a maintenance contract. Then the serviceman has the owner or a responsible employe sign it, too. The carbon copy of this report is given to the customer, while the original copy of the report is turned in at our office by the servicemen and is kept on file for future reference.

"The owner who receives these reports has a record of what's been done as well as the date the inspection service was performed. If he should lose his copy of the report, or forget that he received it, we'll have our copy to back us up. Using this form has eliminated this problem we had previously encountered with maintenance work," says Radoe.

Original and Carbon Copies Of Form Provided

The form is printed on an 8½ by 11-in. sheet, white paper being used for the original, yellow for the carbon copy. The sheets are conveniently assembled in a pad.

Upper section of the form provides space for date, name, address, make, and model of equipment involved. Below this is listed the 17 services to be performed with a "ballot square" in front of each one. The serviceman is required to put a check mark in the squares to indicate the services he performed.

These 17 services are the same as listed on the maintenance contract agreement itself, although the latter adds one more: "Supply emergency service between regular inspections if required."

The 17 items are as follows:

"1. Inspect equipment for refrigerant leaks.

"2. Repair all leaks in refrigerant mains.

"3. Clean condenser once a year on water-cooled systems.

"4. Clean lint and dirt from air-cooled condensers.

"5. Clean all strainers.

"6. Adjust tension on all belts.

"7. Lubricate all moving parts.

"8. Check operating pressures of condensing units.

"9. Purge air from systems.

"10. Check refrigerant in systems.

"11. Charge refrigerant into systems as necessary.

"12. Inspect and adjust temperature controls.

"13. Inspect and adjust safety controls.

"14. Inspect and adjust all valves.

"15. Adjust water regulating valves.

"16. Check operation of refrigerant controls.

"17. Inspect oil in compressor and replenish with oil if necessary."

Space for Owner's Signature

Space at the bottom of the form allows for "remarks and/or recommended repairs if any required," time required, and signatures of the serviceman and owner, or employe of the customer.

In the inspection and maintenance agreement itself, which calls for weekly, monthly, quarterly inspections or other arrangements to suit the needs and desires of the customer, there are other provisions besides the list of services to be performed.

The agreement states, for example, that "parts, or other materials required in the performance of the maintenance services included in this agreement shall be at the expense of the purchaser unless otherwise specified. Prior to the installation of new parts, the dealer will advise the purchaser as to what parts or materials the deal recommends be replaced or repaired. The purchaser agrees to pay the dealer for parts and materials at the time of repair at the dealer's current list prices, less 15%. Parts and materials ordered by the purchaser hereunder are subject to availability at the time of ordering."

Included also in the agreement, is this: "It is to be understood that this agreement is a maintenance service agreement for the purpose of making only normal adjustments to the above equipment, and that dealer is not required under this agreement to make repairs necessitated because of negligence or misuse of the equipment, or because of any other causes beyond the control of the dealer. Service calls which originate from causes not included in the scope of this agreement will be charged for at regular rates."

10-TON air conditioner cools eggs and employes at the same time in this egg sorting room at Page & Cox in Detroit. The tunnel for cooling eggs is at the rear of the picture and the extension duct which cools the workers is at the top of the tunnel.

Egg Cooling System Also Keeps Employes Comfortable—and Does It Inexpensively

DETROIT—The problem of Page & Cox (local egg packer), was not "Which comes first—the chicken or the egg?" but "Which comes first—the employe or the egg?"

The question was whether to cool the egg and protect its quality or to cool the employe and improve his efficiency.

J. R. Miller of the J. R. Miller Corp. here answered the question by cooling both—in an unusual and inexpensive way. It's done with the use of a remote suspended 10-ton unit Frigidaire air conditioner (DF-123) connected to a CWK-1000T 10-hp. Frigidaire compressor.

"The eggs, when unloaded, pass through a large insulated tunnel on conveyors into the processing room," Miller explained. "The conditioned air passes in the same manner through the tunnel, thereby cooling the eggs and then into the process room where it also cools the employes who candle and package the eggs.

"At the end of the work day, dampers are closed so that the cool air, instead of entering the large room area, is recirculated in the tunnel, thereby producing a much lower storage temperature of around 55° until the beginning of the next day."

The merit of the installation has been proven, Miller said, by the purchase of a similar system for installation in another branch of Page & Cox.

Products of
Refrigeration Research
are
Quality Products
— Always —
Refrigeration Research
9901 E. Grand River
Brighton, Michigan

YOU'LL SELL MORE VICTOR BEVERAGE COOLERS *because*

Victors cool more bottles faster..in less space at lower cost..

VICTOR "B" *Beverage Coolers*

SIZES—12-22 & 32 case capacities in self contained models. 17-27 & 37 case capacities for remote installation.

Work horse of the industry...the Victor "B" Beverage Cooler handles peak volume easily...cools load after load of warm bottles quickly and safely...delivers drinks cooled right, with label intact.

Victor Beverage Coolers are engineered for more *profitable* sales of bottled beverages. Designed handsomely to look right in all types of establishments; bars, hotels, taverns, roadside stands, grocery and drug stores or in the finest clubs.

The smart buy in Beverage Coolers is Victor...and your customers know it!

Victor Products Corporation, Hagerstown, Md.
A FUNKHOUSER INDUSTRY
MANUFACTURERS OF THE FAMOUS VICTOR QUICKFREEZE

Providing Zone Control with Minimum of Dampers, Controls

4 Factory-Assembled Units Used In Parts Depot System At Lincoln Mercury

DETROIT — How to accomplish zone control with the least amount of dampers and controls?

That was the problem faced by John J. Kramer & Associates of suburban Dearborn in air conditioning a multi-zone office building—the Lincoln Mercury Parts Depot in Detroit.

The manufacturer's representative solved the problem by selecting four complete factory-assembled Marlo Coil Co. air handling units with a combined capacity of 180 tons and delivering 70,000 c.f.m.

To further conserve space, it was explained by John J. Kramer, the Marlo horizontal units were installed two high. The upper units serve the second floor, the lower units the first floor; the "North" units serve the North end of the building, the "South" units the South end. Thus, there are actually four major zones in the unusual installation, he pointed out.

Each unit is complete with heating coils, cooling coils, face and bypass dampers, and filters.

"This type of installation gives the control advantages of a two-duct system without the expense of the two ducts," Kramer asserted. "Heating and cooling can be delivered to the building at one time as called for by the requirements of the individual zones."

He listed three advantages of the system:

"1. Factory assembled equipment results in lower cost by elimination of field work.

"2. Conservation of space by 'stacking' units two high. Less than one half of the critical floor space was used with this system than with an equal field-erected system.

"3. In the event of equipment failure, only 25% of the capacity would be inoperative."

CONSERVATION of space was accomplished by this stacking of horizontal units at the Lincoln Mercury Parts Depot in Detroit. The upper unit serves the second floor and the lower the first floor. Another similar installation cools the opposite end of the depot.

Cotton Mill Air Conditioned

GREENVILLE, S. C. — The Poe Cotton Mill, one of Greenville's leading textile plants, has just completed an air conditioning program, reported to have cost in excess of $250,000.

Existing window openings were bricked up and complete air conditioning facilities were provided by the Daniel Construction Co.

SHIPPING ROOM of Pioneer Suspender Co. is cooled by a UsAirco conditioning unit located in an adjoining equipment room. Heat load at floor, from boiler room below, required 12 tons of cooling. Air entrapment between stock bins, at right, was overcome by individual distribution grilles at each aisle.

Air Conditioning This Manufacturing Plant Proved Cheaper Than Ventilating

DARBY, Pa.—Use of air conditioning proved less expensive than ventilating due to unusual heat conditions in the shipping room of a men's furnishings manufacturing plant here, the United States Air Conditioning Corp. reports.

The shipping room, in the Pioneer Suspender Co.'s plant is situated over large basement boilers, has three walls of glass, and is divided into aisles by steel stock bins which hinder air circulation.

Floor temperatures in the 9,000-sq. ft. room ran as high as 125° F. due to heat from boilers below.

Preliminary design of a ventilating system called for intake as well as exhaust fans, for movement of the tremendous volumes of air necessary to produce satisfactory working conditions.

Calculations showed that an air conditioning system utilizing a U. S. Air Conditioning Corp. 30-ton refrigerated Kooler-aire packaged unit could be installed to provide comfort cooling at a cost considerably below the estimate for ventilation while meeting tight equipment space requirements at the same time.

As designed and installed by Air Conditioning Associates, Inc., Philadelphia, the system places the compact RK-30 in an adjacent equipment room, with ductwork connecting to the shipping room. Satisfactory air distribution is provided by a grille at each of the aisles formed by the stock bins.

The system utilizes 15% fresh air, obtained through a short duct run from the rear outside wall of the building. Exhaust for the UsAirco unit's built-in evaporative condenser is also taken to the rear of the building.

The system provides a complete change of fresh air every hour and uses 12 tons of cooling just to overcome the extreme heat load at the floor.

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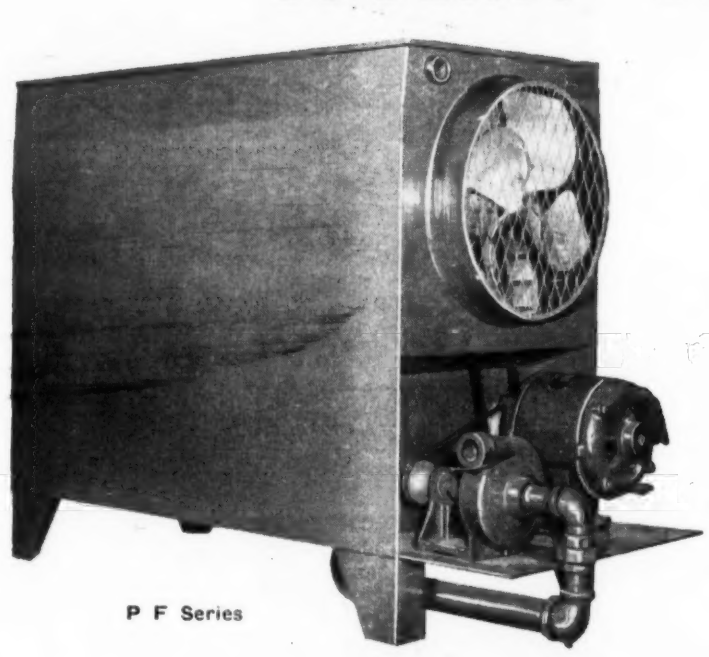

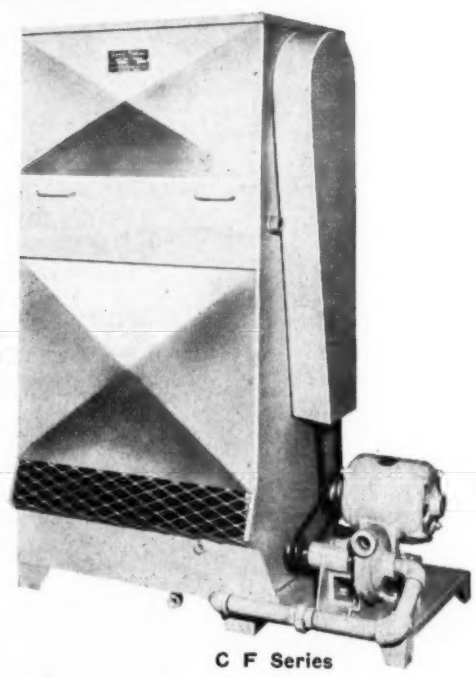

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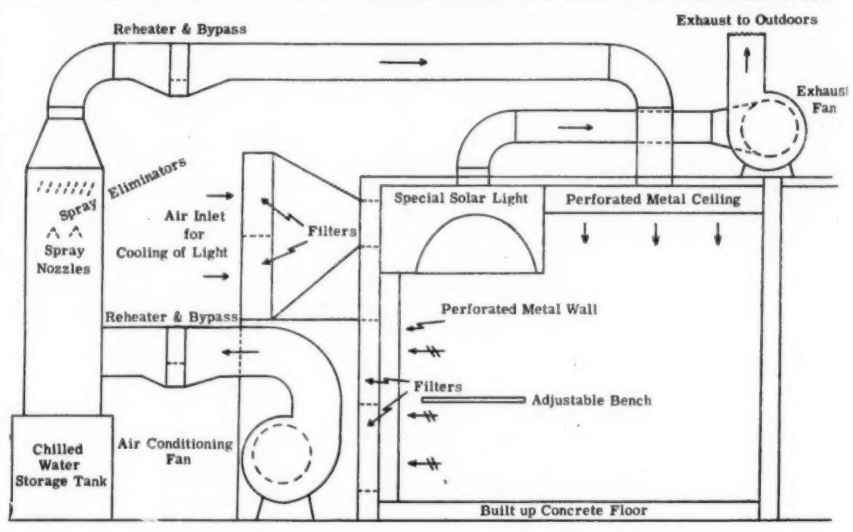

TYPICAL air flow diagram of cubicle in Harvard's biological laboratory. This system allows only 1° temperature rise and 1% r.h. drop.

Air Conditioning In Harvard Laboratory Controls Temp., Humidity In Plant Tests

BOSTON—When a high intensity artificial solar light is turned on in a cubicle of the biological laboratory at Harvard university, the temperature rises by less than 1° F. and the relative humidity falls less than 1%.

Such rigidly stable air conditions are maintained by a Westinghouse air conditioning system engineered and installed by Carrier-Mandell, Inc. here.

Purpose of the installation is to make possible tests of plant growth under rigidly controlled atmospheric conditions, Earl Carrier of the air conditioning firm explained.

These tests are conducted in three cubicles supplied with high intensity artificial light that provides the same intensity of heat as that reaching the earth's surface from the sun.

The air conditioning system controls these cubicles and an access corridor besides. Each of these cubicles is controlled individually so that any one can be operated independently of the others.

For the purposes of the tests, the air conditioning must permit temperatures at any point between 66 and 86° F., combined with any relative humidity between 60 and 90%. Plants were exposed to heat and ray intensities varying from full light to complete darkness.

For this installation, Carrier-Mandell used two Westinghouse CLS-110 hermetically sealed compressors, four Westinghouse, Sturtevant, Rexvane fans, and a spray chamber laboratory system, specially designed by the company.

Full spray type vertical air conditioners were used to obtain full dewpoint control.

To handle the rapid air change required by the concentrated load and high humidities, a perforated metal ceiling was installed above the plant specimens for supply. For return of air the same metal was set in the wall.

The scientist in charge of this laboratory worked very closely with Carrier-Mandell, checking the installation every step, Carrier said. The job has worked out so well that he is very enthusiastic about it, Carrier declared.

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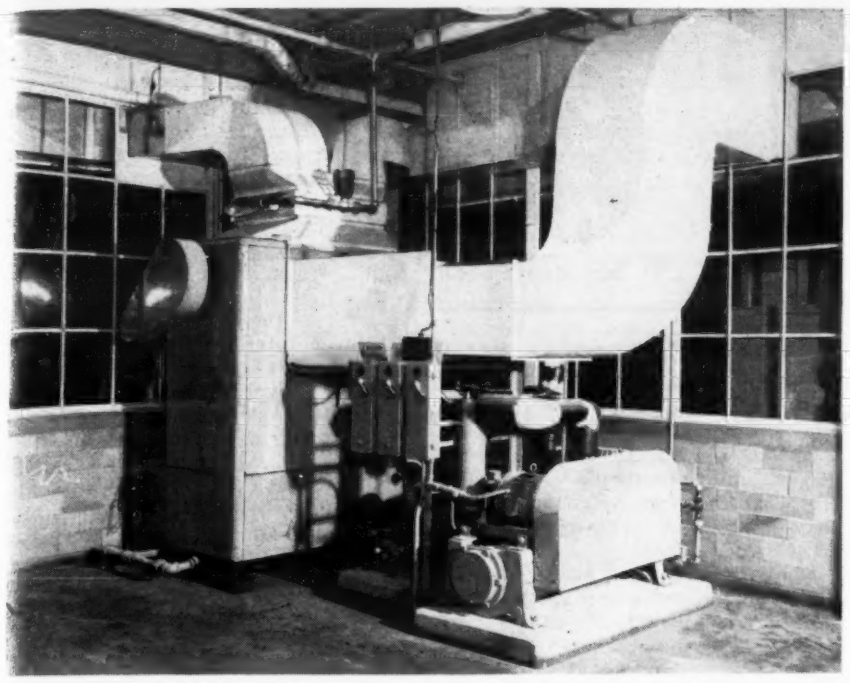
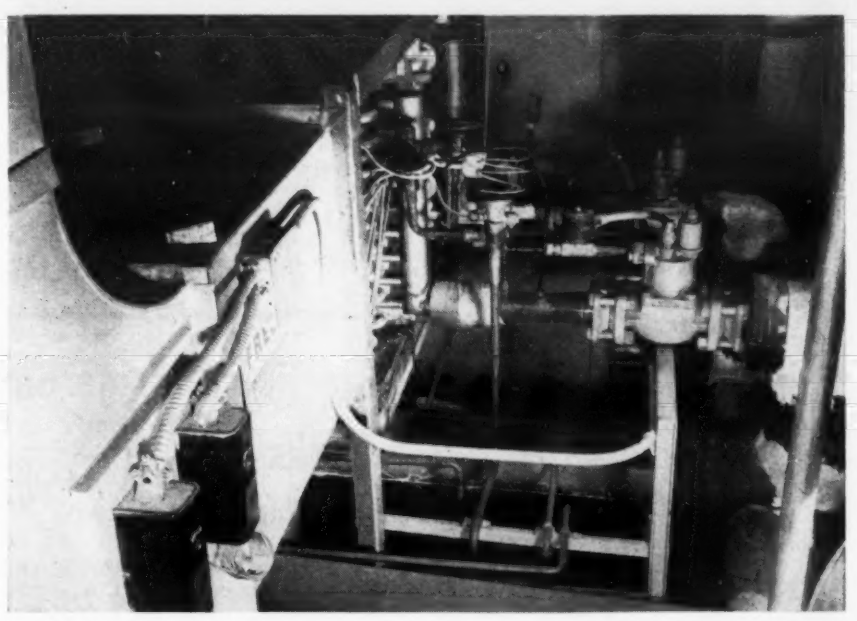
DX Coils Dry Air For Drug Producer

Unusual System Holds 25% Humidity for Parke, Davis & Co.



This is the equipment that maintains 25% relative humidity in the special room where poison tablets are produced by Parke, Davis & Co., one of the world's largest manufacturing chemists. Two direct expansion coils cool outside air to 35° F. to remove moisture before air goes to chilled water unit at left.



Two thermostats at lower left control 5 and 3-hp. systems independently to remove moisture from incoming outdoor air by cooling it first to 45° and then to 35° F. It is later reheated to 80° F., pulling relative humidity down to approximately 25%. If incoming air is below 45° only one unit operates; if below 35°, neither unit runs.

By C. Dale Mericle

DETROIT—Problem of maintaining extremely low humidity conditions in a special room for drug manufacturing was solved for Parke Davis & Co., one of the world's largest drug producers, by the installation of a direct expansion air conditioning system engineered by Deke Jones, who manages the Detroit branch for J. Geo. Fischer & Sons here.

Design conditions for the room called for maintaining a relative humidity of 20% to 25% with a dry bulb of 80° F. These conditions were not being achieved by the existing air handling equipment, which included a chilled water unit.

In the room were two large air driers, which produced considerable sensible as well as latent heat even though 500 c.f.m. was exhausted directly from the driers.

Originally the chilled water fan unit supplied 4,000 c.f.m. to the room, all the air being recirculated. Chilled water entered at 45° and left at 55°, coming from a central chilled water supply cooled by a large centrifugal compressor. A steam coil was also provided in the discharge duct.

The new system devised by Jones included replacing the original chilled unit air unit with one of modern design produced by Bush, but the most important change was the installation of direct expansion coils in an outside air intake added to the system.

"What we did was to install an outside air duct for the chilled water unit located in the adjoining room," Jones explains. "This was designed to deliver 750 c.f.m. of outside air.

"Ahead of the unit we located two direct expansion Bush coils, one supplied by a 5-hp. Mills condensing unit, the second by a 3-hp. machine. Purpose of these coils is to bring this 750 c.f.m. of outside air down to a 35° wet-bulb temperature before it goes into the air handling unit."

When this air is mixed with the recirculated air and brought up to the design dry bulb (80° F.), the over-all relative humidity is reduced to the required 20% to 25%.

The two coils and condensing units cooling (and drying) the incoming outside air provide two-stage drying, as it were. Incoming air first hits a 6-row Bush coil with 2-in. fins spaced 8 fins/in. This coil is powered by the 5-hp. machine and is designed to cool the air down to 45° F.

Second coil is a 4-row arrangement with 2-in. fins spaced 3 fins/in. and is supplied by the 3-hp. unit. This further cools the air from 45° down to 35°.

Operation of both systems is controlled independently by two air thermostats located in the outside air intake ahead of the coils. The one controlling the first (5-hp.) system is set to cut in whenever the incoming air is above 45° F. If the incoming air is below 45° F. this first system will not be operating. Second thermostat controlling the 3-hp. is set for 35°, so this system operates whenever the air is above 35° F.

During colder weather, then, if the outside air temperature ranged between 35° and 45° only the smaller system would operate, and if the temperature fell below 35° F. neither unit would have to run.

Back pressure valves are provided for both coils.

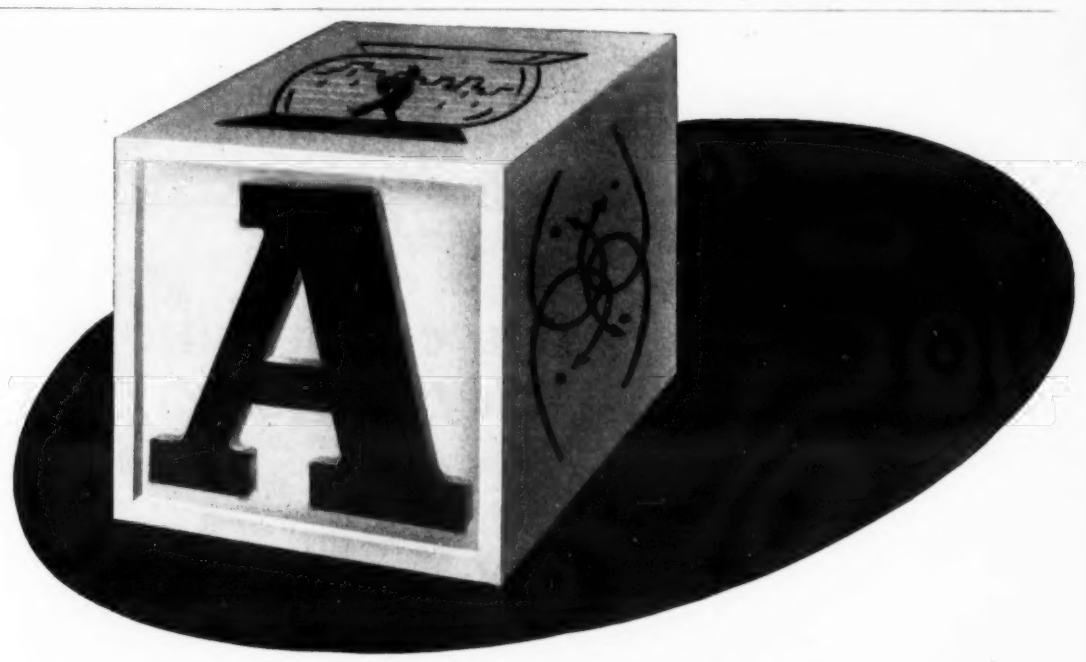
"In setting up the job we set the back-pressure valve to get just about 45° F. on the first coil," recalls Jones. "This can be something of a problem because of the varying outside air conditions, but we obtained pretty consistently 40° to 45° F. with the setting on the first valve regardless of air intake temperature.

"Setting the back-pressure valve on the second coil was critical, but by watching it carefully we got it set to deliver 35° F."

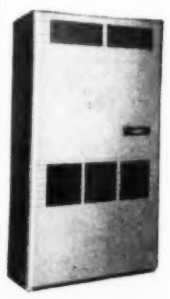
Operation of the reheating coil and chilled water system in the other room is controlled by a pneumatic thermostat which actuates modulating steam and water valves, respectively.

Since making this installation, Jones has engineered several using the same principles to control humidity.

"This setup ran about half of what a chemical type dehumidifier would have cost, and there've been no service problems," he says.



"a" is for "air" . . . basic to all



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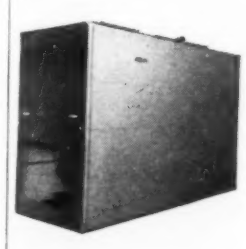

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Refrigeration Problems

and their Solution

by Paul Reed

For Service and Installation Engineers

Paul Reed

Detecting Refrigerant Leaks (5)

ULTRA-VIOLET LAMP DETECTOR

Another method of locating refrigerant leaks depends upon the oil that leaks out along with the refrigerant. All compression systems require oil in the compressors to lubricate them. Ideally, the oil should stay in the compressor, for it is not required elsewhere in the system, although in small amounts it does very little harm.

Nevertheless, some of the compressor oil does circulate with the refrigerant. This is true of all refrigerants; but the amount of oil circulating with the refrigerants that are "oil-miscible" (that mix readily with oil) such as the "Freons," methyl chloride, etc., is greater than with the refrigerants such as sulphur dioxide, ammonia, and carbon dioxide, that do not mix readily with oil.

But in practice, there is some oil traveling with any refrigerant as it circulates throughout the system. In case of a leak, both the refrigerant and oil escape through the hole or crack. The refrigerant evaporates and is dissipated into the air; but the oil stays on the outer edge of the hole.

It gradually accumulates there until, in the case of fairly large leaks, it can be seen. The service engineer, in going over a system for leaks, looks for oil spots, for he knows that wherever there is an oil spot, there is apt to be a refrigerant leak, also, for where oil can escape, refrigerant can also. There are exceptions, for example, below the oil level in a compressor, but an oil spot is a good indication that there is a leak of refrigerant as well as of oil.

The trouble is that not enough oil is present around very small leaks, that it is visible to the naked eye. There may be just enough dust on the oil to hide it; or the surface may be so smooth that the oil spreads out in such a fine film that it is not visible.

If, however, we had some sort of light that made oil especially visible in some manner, we could detect oil spots and therefore leaks, at a glance. Ultra-violet light does just that. To understand just how it does it, let us first study light itself.

VISIBLE AND INVISIBLE RAYS

What we call light consists of waves of electrons shot off from the sun, or other source of high temperature, at the tremendous speed of 186,000 miles per second. These electrons are in vibration or waves, and they vibrate at inconceivably high frequencies.

If the frequency is about 450 million million cycles per second, the rays produce what we call a dark red light. If the frequency is almost twice that fast or about 750 million million cycles per second, the rays produce what we call violet light. All the other colors of the rainbow fall between these two colors and are produced by rays of various frequencies between these two rough limits of 450 and 750 million million cycles per second. All of the rays of different frequencies when scrambled together produce white light; and if they are all shut off we see no color at all, and we call that black.

But there are many electrons vibrating at rates slower than 450 million million cycles per second, and many more vibrating at rates much faster than 750 million million cycles per second. They do not affect our eyes, so we do not "see" them, but they are there just the same.

Those rays that are slower than 450 million million cycles per second, we call "infrared" for they are below the red band, in the spectrum or rainbow. These infrared rays are very hot and infrared lamps are designed to throw off a large percentage of these hot infrared rays.

Those rays with frequencies that are faster than 750 million million cycles per second, we call "ultra-violet," for they are *above* the violet band in the spectrum. They are relatively cold rays, but they have various odd properties. Some of them that is, some certain frequencies in the ultra-violet band, have the ability to kill bacteria.

Lights built to throw off a high percentage of these particular ultra-violet rays are called "germicidal" or "bacteriacidal" lamps and are used to retard the decay of meats, and to sterilize food containers, glasses, barber tools, etc.

OIL-FLUORESCENT LAMPS

Still another one of the ultra-violet rays, the one in which we are interested at the present, has the ability to cause certain materials to glow with visible light, even in the dark. There are many materials—about 3,000 known ones—that are thus affected, and when they glow we call them "fluorescent."

None of the refrigerants are known to be fluorescent. Most, but not all, oils become fluorescent under ultra-violet light, and this is especially true if the rays are of a frequency of about 820 million million cycles per second. When exposed to these rays, a very tiny spot of one of these oils, even a spot that is invisible to the naked eye, glows brightly and is easily seen in the dark.

In fact, the fluorescent oil is seen much easier in the dark than in the light. So in searching a system for leaks, we darken the room somewhat, not pitch dark, but only light enough to see to get around in. We then shine the rays from an ultra-violet lamp specially designed to cause oil to become luminous or fluorescent and the oil spots around quite small leaks become little spots of light.

The ultra-violet lamp throws off visible light, too, a violet light. But it is not these visible violet rays that cause the oil to become fluorescent. It is those certain ultra-violet rays that are invisible which are particularly effective. In fact, the ultra-violet lamp gives too much visible light, which tends to make it difficult to see the luminous oil spot. Therefore, the lamp is shielded with a purple filter that takes out most of the visible light, leaving just enough to work by.

The lamp that throws off ultra-violet light, or black light, as it is also called, can be battery operated and thus fully portable, or it can be designed to operate on ordinary 110-volt house current from an extension cord. The battery type is used a great deal by prospectors for certain minerals and by oil geologists for testing samples of sand from oil well drillings.

The ultra-violet lamp leak detector is particularly useful in making quick, periodic inspections of the refrigerant lines of large installations. It is useful in testing underneath floors and similar places difficult of access.

It is used by several manufacturers on their assembly lines, to show leaks quickly and easily while the unit is on the moving conveyor. However, they do not depend on it exclusively, for they also use other leak detection methods such as the electronic detector, the halide torch, the submersion test, etc.

Some servicemen have ultra-violet lamp leak detectors, and find that they are helpful for certain uses as indicated above, to supplement but not take the place of the halide torch, ammonia swab, sulphur or halide candles, etc.

BE THOROUGH AND PATIENT

Whatever the leak detection method, it is most important that the service engineer use care and patience. He must be thorough and if he has had to add refrigerant to an installation and thus knows that there is a leak somewhere on it, he should not give up until he finds it.

In many cases it is not the loss of a fe wounces of refrigerant per year that is so important, but the effect on the customer of having to call the serviceman every so often to add refrigerant. Even the user knows that this should not be necessary, and that somehow the leak can be found and repaired.

NPA Names B. W. Clark to Electrical Equipment Div.

WASHINGTON, D. C.—Bonnell W. Clark was recently named director of the electrical equipment division of the National Production Authority.

The division is responsible for production and distribution of materials and components for electrical products needed in the defense program and essential civilian activities.

Clark retired as vice president in charge of sales for the Westinghouse Electric Corp. in January, 1950. He had been with the corporation for 25 years.

Clark joined the Westinghouse Electric Supply Co., New York City, in 1925. He was named general manager of the company in 1929 and president in 1935.

In 1941 Clark headed the Westinghouse plant in Mansfield, Ohio, as the corporation's vice president in charge of appliances. The next year he became vice president in charge of sales in Pittsburgh.

Clark is past president of both the National Association of Electric Distributors and the National Electric Manufacturers Association.

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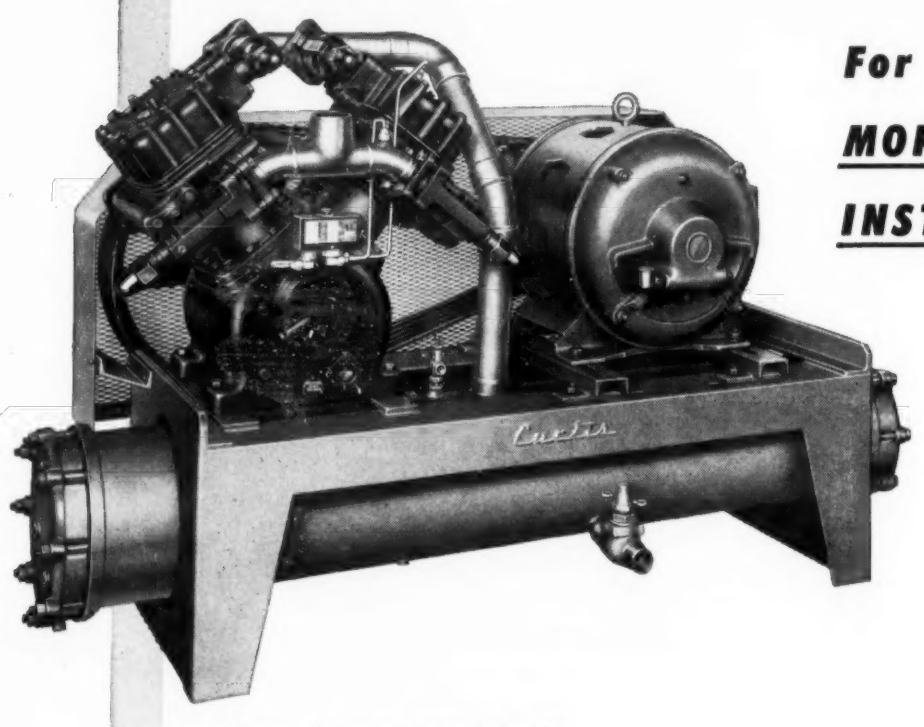

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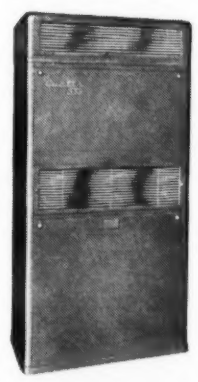
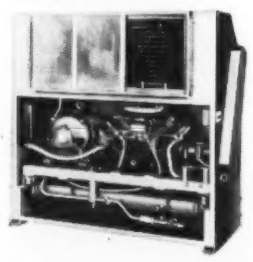


Packaged Type, 2, 4, 6, 8 Tons



Central Type, 10, 15 Tons

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Detroit Drops Plan To License Journeymen--

(Concluded from Page 1, Column 2)

of the all-day session arose over the proposed article to license refrigeration journeymen.

Only the representative of the Refrigeration Contractors Association of Detroit, which initiated the article, spoke out in its favor. Such licensing was opposed by all other representatives except John C. Rehard, Detroit's chief safety engineer and chairman of the committee, who represented the Bureau of Safety Engineering. Rehard stayed "strictly on the fence."

Consensus was that, though the members of the committee favored the idea of the improving the industry (which the contractors said was their primary motive) the committee felt that this was not the way to accomplish it.

In the final vote, 10 votes were registered against the article, with all others abstaining.

JOURNEYMEN REQUIREMENTS

The proposed article had defined refrigeration journeymen as "such persons as are qualified and licensed by the City of Detroit to perform or supervise on the job performance of work in the installation, alteration, or servicing of any refrigerant-containing part of any refrigerating system."

Prerequisites to taking the examination for a journeyman's license required either three years' experience in installation or servicing work, or a minimum of one year's experience if the applicant were a graduate mechanical or chemical engineer, a registered professional engineer, or had completed a course in refrigeration with a recognized trade school.

Licenses for journeymen would have cost between $2 and $10 and would have been renewed annually.

Objections to such licensing raised at the committee meeting included such points as that it would add to the pyramid of licenses already required; it added nothing to the safety of installations; it would add to the cost of installations, and it was not the job of the city to do the industry's policing.

Representatives of both the Refrigeration Service Engineers Society (Greater Detroit chapter) and Pipe Fitters Local No. 636 read resolutions against the licensing provision.

Concerning the safety factor, Rehard said that even with the licensing of journeymen, the city would still hold the contractor responsible for the safety of the installation. The city cannot go beyond the contractor, he indicated, leaving it up to the contractor to bring suit against the employe if the contractor felt he was at fault.

CHANGES FOR CONTRACTORS

Contractor licensing features of the present Detroit code would also be changed somewhat if the proposed new ordinance is adopted. This, too, led to a considerable amount of discussion.

To qualify for the examination leading to a contractor's license under the code now in force, the applicant must have had three years' experience or two years of actual experience if he is a graduate in refrigeration from a school of engineering.

Present law provides also that the owner of the contracting firm does not himself have to qualify for and pass the tests for a contractor's license provided that he has a supervisory employe who can qualify and pass. The license is issued in the employe's name, in this event.

The proposed ordinance would have set up a minimum of five years' experience (instead of three) of which a minimum of two years had to be actual experience for either the contractor or supervisory employe. Credit would be given for educational background.

Some members of the study committee offered objections to increasing the experience requirement from three to five years, their chief point being that it doesn't require five years to learn how to service household systems.

Rehard pointed out that "we find that the five-year requirement is more in line with other licensing provisions of the city."

Finally a compromise measure suggested by Rehard won the approval of the committee. If finally adopted, this would require three, four, and five years' experience (including credit for education) for Class "A," "B," and "C" licenses, respectively.

The Class "A" license limits the holder to installation and servicing of completely self-contained household refrigerators for private use in residential occupancies.

Class "B" license limits the holder to work on systems having motors or engines not exceeding 7½ hp. The Class "C" license is unlimited.

DROP USE OF 'TONS'

Incidentally, the Class "B" requirement includes another change. The existing code limits it to "5 tons," whereas the proposed change limits to systems with motors or engines not exceeding 7½ hp.

Rehard explained that the increasing use of low-temperature refrigeration has made the tonnage classification unsatisfactory, because a low-temperature system could have a small rated tonnage and yet have a large refrigerant charge. The horsepower rating, he believes, gives a fairer basis of comparison for purposes of safety.

In approving the adoption by reference of the B9 safety code, the study committee agreed to two changes, after some rather spirited discussion. One change pertains to requirements on soldered joints.

As approved by the study committee, the requirements on this subject in the proposed code will be as follows:

"Soldered joints on copper tubing used in all refrigerating systems in buildings for institutional and public assembly uses and in refrigerating systems containing more than 20 lbs. of refrigerant gas in buildings of other use groups shall be fabricated with solders or alloys having melting points of not less than 1,000° F., except that approved self-contained equipment having a refrigerant charge of 6 lbs. or less of Group 1 refrigerants be permitted to have 95-5 solder joints."

CHECK VALVE REQUIRED

Another section of the proposed Detroit code that differs from B9 requires a discharge check valve in the discharge line from each compressor used on a refrigerating system containing more than 40 lbs. of a Group 2 or Group 3 refrigerant.

A minor change in terminology was made at the request of Frank Carter, representing the Refrigeration Equipment Manufacturers and RISAC. He said that RISAC objected to the use of the term "use" licenses, when the licenses were merely to cover inspections.

With the change, the former "Annual Use License," which has been in effect for 35 years on larger installations, now would become the "annual inspection license fee."

Rema To Elect--

(Concluded from Page 1, Column 3)

association who will speak include Dr. Kenneth McFarland, superintendent of schools, Topeka, Kan., and John L. Cobbs, of *Business Week* magazine.

Other scheduled speakers include L. W. Larsen, sales manager, Refrigeration Div., Tecumseh Products Co., who will speak on "Refrigeration Regulating Legislation," and Cyrus W. Miller, executive secretary and safety code consultant of the Refrigeration Industry Safety Advisory Committee, who will present a report on this committee's operations.

Product section meetings will be held on April 30, and the annual meeting will open with a breakfast session on May 1, at which R. H. Israel, president of Rema, will present his annual report.

Past presidents of the association will be presented with distinguished service awards.

Restaurant Show--

(Concluded from Page 1, Column 4)

equipment at the exposition will be many in the air conditioning and refrigeration industry.

Opening day has been designated as "Dealer Day." On that day, the exposition will be open only to institutional food wholesaler and food service equipment dealer executives, buyers, and salesmen, and there will be no program sessions.

Among features of the convention will be talks on government controls and manpower, and food demonstrations.

CMP Date Set--

(Concluded from Page 1, Column 4)

Repair shops, say NPA officials, will not file since they will be covered by a special CMP regulation which will assure them of needed materials without application to NPA. Manufacturers of repair and replacement parts will, however, be required to file with NPA.

NPA officials believe that there will be a substantial balance of steel, copper, and aluminum available for non-defense use after allotments have been made under CMP. They further state that "a rough balance between supply and demand for the left-over balance will be preserved by using other NPA powers, such as 'M' or limitation orders, to reduce less essential civilian production and assure a proportionate amount of materials for all civilian business."

As it appears now, however, it seems likely that those outside the cover of CMP will have to "scramble" for the steel, copper, and aluminum that remains. This leads to a belief that production of consumer durable goods may be reduced further than they might normally be under the limitation orders, because of the fact that priority standing will have been given to many activities which did not enjoy any preference before.

The question arises—what will happen to the "DO" priority ratings. NPA hasn't said anything on this point, but some observers are predicting that NPA doesn't want to quit the present "single-band" system of priorities, and that "DO" ratings will be continued. But there is no official confirmation of this thinking.

Sparks-Withington--

(Concluded from Page 1, Column 2)

a 10-ft. job, with emphasis on the latter. This deluxe model will be known as the "Big 10" to emphasize the following 10 outstanding mechanical features:

Big-70 Freezelocker, Kol-Dial to -10°, chill chamber, adjustable shelves, jumbo Vapo-Crispers, door shelves, butter bin, Sparton Dri-Chest, Speedicube ice trays, and hermetically sealed compressor.

Pierce added, "Dealers will be allowed to add refrigerator volume to their television and radio volume, to earn retroactive discounts up to 3%.

"The total number of refrigerators for the first 12 months, with deliveries starting May 15, will be limited."

JORDON "GLAMOUR" is more than skin deep!

There's both HEAVY-DUTY CONSTRUCTION and SHOW-CASE BEAUTY IN THIS FROZEN FOOD and ICE CREAM MERCHANDISER

★ Designed, field-tested, and produced by an old-line manufacturer of show cases.
★ Each unit properly and amply refrigerated to give complete protection to contents.
★ NO WOOD USED. All seams electrically welded and permanently vapor-sealed.

Hermetic units on pullout tracks.

Note extra heavy insulation and EXTRA refrigeration coils in walls and dividers.

Welding assures rigid, lifetime construction.

Model OF9M with Exclusive "REMINDER SHELF"

LOW TEMPERATURE MERCHANDISERS with Open Top Glass Front or Sliding Doors

Model OF17 Open Top—Glass front

Model M 26

Model M 17

JORDON provides the EXTRAS for SUCCESSFUL PROMOTION

★ EXTRA 'showmanship' that helps to open new and profitable outlets for frozen foods and packaged ice cream. ★ EXTRA 'salesmanship' to turn these locations into volume producers both in-and-out of season. ★ EXTRA service from a nationwide organization with warehousing and trained field men in every part of the country. Your inquiry is invited!

JORDON Makes A Complete Line of Commercial Refrigerators

Reach-ins

Two-Temperature Refrigerators

Beverage Coolers

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Jordon AMERICA'S MODERN COMPLETE LINE

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58th Street & Grays Avenue, Philadelphia 43, Penna. Bilgrade 6-4510

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Another KRAMER First!

THERMOBANK for AMMONIA

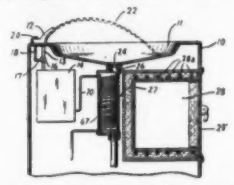
For the First Time, a completely automatic ammonia system for freezing temperatures.

WRITE FOR BULLETIN TA 182

KRAMER TRENTON CO. TRENTON 5, NEW JERSEY

PATENTS *Weeks of Nov. 21 & 28 (Continued)*

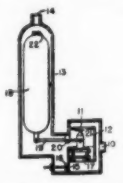
2,532,026. PRECOOLER WITH INTERNAL FINS. Heinrich J. Kellershon, Douglaston, N. Y. Application July 3, 1948, Serial No. 36,882. 8 Claims. (Cl. 62—141.)



1. In a water cooler of the type including a refrigeration unit, a supply pipe through which water is delivered to the refrigeration unit, and a drain for waste water, the combination with said drain of a pre-cooler through which the water from the drain is discharged, said pre-cooler comprising a cylindrical chamber having a helical conduit in heat-exchange relationship with the outside wall of the pre-cooler, the upper end of said helical coil being connected with the supply pipe to the refrigerating unit, and the lower end of said helical conduit being connected with a water main, a plurality of fin elements located in the pre-cooler and connected with the inside wall of the pre-cooler, each of said fin elements comprising a metal member having a bend providing a high ridge across the fin element and fins sloping downward on both sides of said ridge, said fins sloping downward to the sides of the pre-cooler, and said fins having openings therein in staggered relation with one another so that the surfaces of successive fins extend under the openings in the respective fins above them for the drainage of water through each fin into contact with the surface of the fin immediately below it.

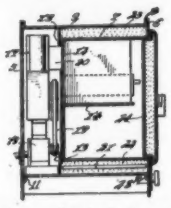
2,532,074. PROTECTIVE APPARATUS FOR REFRIGERATING SYSTEMS. Alexis Poukhalo-Poukhlovsky, Paris, France, assignor to one-half to Konstanty P. Puchlowski, Pittsburgh, Pa. Application Nov. 19, 1946, Serial No. 710,837. In France Nov. 22, 1945, 20 Claims. (Cl. 62—115.)

3. Protective apparatus for refrigerating systems, comprising a vessel for refrigerant having conduit means for connection to the system to be protected, valve means for controlling the flow of refrigerant in the system, density-responsive control means disposed in said vessel to respond to changes in density of the refrigerant, and means connecting said control means with said valve for closing



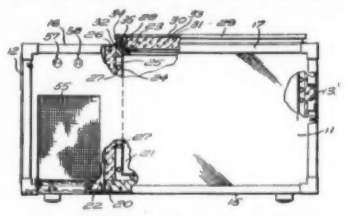
said valve to prevent the flow of refrigerant in the system when said density drops below a normal value, and exteriorly actuable resetting means for causing said valve to open.

2,532,090. REFRIGERATOR FOR AUTOMOBILES AND MOTOR BOATS. Jerome J. Dubuc, Burlington, Vt. Application Jan. 29, 1946, Serial No. 644,020. 1 Claim. (Cl. 62—116.)



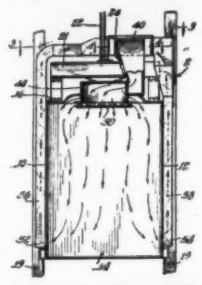
A refrigerator adapted for use in small spaces comprising an outer and an inner compartment, said outer compartment having a rear wall, top, bottom and two side walls, the latter four walls having flanges at their front and rear ends, said rear flanges being adapted for connection with the rear wall, said inner compartment having a rear wall disposed at a predetermined distance and parallel to said rear wall of the outer compartment and top, bottom and two side walls, the latter four walls having at their front an upwardly bent flange and at their rear an inwardly bent flange, the outwardly bent flange of the last mentioned four walls engaging the front flanges of the first stated four walls, insulation means disposed between the said respective four walls of the inner and outer compartment and an insulation layer outside of the rear wall of the inner compartment, a liquifying unit disposed between the outer and inner rear wall, an insulated door closing the front opening of the inner compartment, a food compartment disposed in said inner compartment, and a cooling unit extending from the liquifying unit into said food compartment and an additional cooling coil disposed within the insulation between the walls of the inner and outer compartment.

2,532,234. PORTABLE ELECTRIC REFRIGERATOR. Harry E. Kimble, Albuquerque, N. Mex. Application May 3, 1947, Serial No. 745,821. 1 Claim. (Cl. 62—116.)



In a portable electric refrigerator, a cabinet having side walls, end walls, a bottom wall and a top wall, an insulated partition intermediate the end walls and dividing the cabinet into a cold compartment and a mechanism compartment, said mechanism compartment containing a motor compressor unit, a refrigerator reservoir, a condenser, and cooling coil connections from the compressor unit to the condenser, to the reservoir and back to the compressor unit, providing a closed circuit cooling system, said cold compartment having a metal inner liner spaced from the walls thereof, the cooling coils from the compressor unit extending into the cold compartment within the space between the metal liner and the walls, said cooling coils being soldered to the metal liner and said space being filled with insulation, the top wall of said cabinet having an opening above the cold compartment, and an insulated cover removably closing said opening, said motor compressor unit including a power circuit having a battery connection and an alternating power connection in parallel, the alternating power connection including a transformer and a rectifier.

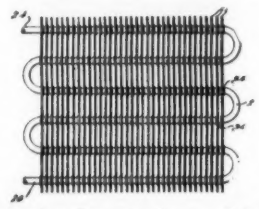
2,532,268. AIR-CONDITIONED ELEVATOR. William F. Christmann, Chicago, Ill., assignor to Kroeschell Engineering Co., Chicago, Ill., a corporation of Illinois. Application Nov. 10, 1947, Serial No. 784,975. 15 Claims. (Cl. 62—129.)



1. In an elevator, the combination comprising an elevator car adapted for reciprocation in a vertical shaft, said car having a floor, side walls, door and ceiling, means carried by the car for controlling air temperature and humidity within the car chamber including a refrigerating unit, cooling conduits, an air impeller, an electric motor for driving the impeller, inlet and outlet passageways for directing air toward and away from said impeller, and conduit means associated with outlet passageway for causing conditioned air to be delivered to the upper portion of said car and conduit means interconnecting the lower portion of said car and said inlet passageway for returning said air to said inlet passageway.

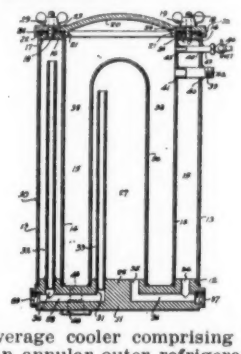
Week of December 5

2,532,303. APPARATUS FOR MAKING FINNED TUBE HEAT EXCHANGERS. James R. Hayward, Washington, Ind., assignor to McCord Corp., Detroit, Mich., a corporation of Maine. Original application Nov. 29, 1945, Serial No. 631,540. Divided and this application Feb. 6, 1948, Serial No. 6,663. 10 Claims. (Cl. 153—48.)



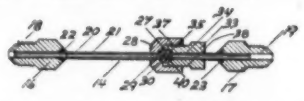
1. Apparatus for securing a slotted sheet material fin to a round tube extending through the slot in said fin comprising a die having a slot for receiving said tube and a transverse slot for receiving said fin with the tube extending through the slot in said fin, said fin having portions capable of being deflected around the tube, said tube slot in the die having a seat for receiving and holding said tube when the fin is pressed onto said tube and said die having means adjacent the bottom of said tube slot therein for engaging said portions of the fin adjacent the slot and deflecting said portions of said fin around the tube on the open side of said slot when said fin is pressed onto said tube.

2,532,328. BEVERAGE COOLER. Jackson W. Penning, Roseville, Mich. Application April 11, 1946, Serial No. 661,401. 7 Claims. (Cl. 62—141.)



1. A beverage cooler comprising a base member, an annular outer refrigerant container connected to said base member, a central refrigerant container likewise connected to said base member, the walls of said refrigerant containers defining a beverage chamber therebetween, means for supplying refrigerant to said refrigerant containers, and removable closure means engaging the open end of said beverage chamber, said base member having a beverage outlet passageway therethrough.

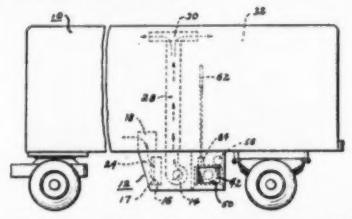
2,532,452. EXTERNALLY ADJUSTABLE TUBULAR FLUID RESTRICTOR FOR REFRIGERATION SYSTEMS. Anthony F. Hoesel, Chicago, Ill., assignor, by mesne assignments, to Albert Wittlin, Chicago, Ill. Application June 14, 1945, Serial No. 599,489. 2 Claims. (Cl. 138—45.)



1. An externally adjustable tubular fluid flow restrictor assembly for passing a controlled volatile refrigerant fluid flow to a cooling unit, which comprises the combination of a fine bore compressible metal tube, of given length, hermetically sealed to an inlet fitting and to an outlet fitting, an outer short length ferrule on the tube intermediately of the inlet and outlet fittings, and two inter-engaged threaded compression members mounted on the tube at opposite ends of the ferrule and arranged to engage the same and capable of compressing both the ferrule and the tube wall during wrench-up, so that the tube bore may be contracted for controlling the flow rate of the volatile refrigerant fluid through the assembly.

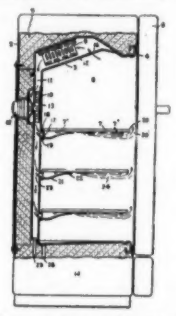
2. For interposition in the liquid circuit of a refrigeration system having an evaporator, a pressure restrictor comprising a tube of compressible metal having a potential refrigerant liquid flow rate in excess of the vaporizing capacity of the evaporator, and compression means comprising a ferrule arranged on the tube between the ends thereof, said ferrule being oppositely tapered toward its ends, and two inter-engaged threaded compression members slidably mounted on the tube at opposite ends of the ferrule and having tapered portions arranged to engage the tapered portions of the ferrule and capable of relative adjustment to compress the ferrule radially to reduce the size of the opening in the ferrule and compress the tube inwardly and reduce the diameter of the bore and simultaneously increase the wall thickness of the reduced portion of the tube.

2,532,618. REFRIGERATED VEHICLE. Charles F. Henney, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application Nov. 13, 1944, Serial No. 563,148. 9 Claims. (Cl. 62—4.)



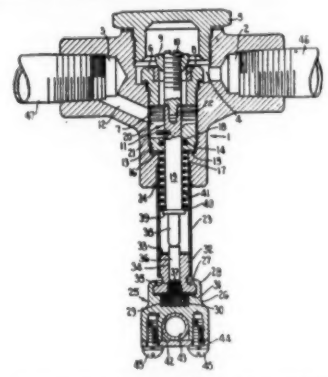
1. In a system for supplying refrigerated air to a space, an evaporator for cooling said air, a condenser, a compressor for withdrawing refrigerant vapor from said evaporator and for discharging compressed refrigerant into said condenser, compressor operating means, clutch means between said compressor and said compressor operating means, selective means for selectively directing either recirculated air or outside air in thermal exchange with said evaporator, and clutch control means for said clutch, and interlock means between said selective means and said clutch control means for insuring that said clutch is in the declutched position when outside air is directed in thermal exchange with said evaporator.

2,532,816. AIR CIRCULATING ARRANGEMENT FOR REFRIGERATORS. Lowell M. Kurtz, Erie, Pa., assignor to General Electric Co., a corporation of New York. Application Nov. 16, 1949, Serial No. 127,662. 12 Claims. (Cl. 62—102.)



1. The refrigerator cabinet including an outer wall, an inner wall spaced from said outer wall and defining a food storage compartment, a plurality of substantially imperforate shelves arranged in spaced relationship within said compartment and dividing said compartment into sub-compartments, said inner wall having a plurality of norizontal openings therein, each of said openings being arranged immediately below the lower rear edge of a corresponding one of said shelves, the forward portion of each of said sub-compartments being unobstructed at least in the region immediately below the forward edge of said shelves, means for circulating air through said openings into said compartment, and means adjacent each of said openings for directing air toward the forward portion of said compartment closely adjacent the under side of the corresponding shelf whereby the moving stream of air is confined to the region in the vicinity of the under side of each shelf and contact between the circulating air and food stored on the shelves is minimized.

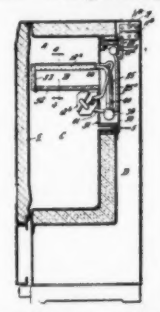
2,532,896. TEMPERATURE OPERATED VALVE. Earnest J. Dillman, Detroit, Mich., assignor to Detroit Lubricator Co., Detroit, Mich., a corporation of Michigan. Application Dec. 6, 1944, Serial No. 566,803. 6 Claims. (Cl. 236—99.)



1. A thermostatic valve, comprising a tubular supporting member, a temperature responsive power element carried by one end of said supporting member, said element having a cavity and having a hollow extension fitting within said supporting member, temperature responsive material in said cavity, said cavity being alined with the bore of said extension, pressure responsive means sealing said bore, a plunger seating on and movable by said responsive means and guided in said bore, a valve casing carried by the other end of said supporting member and having a valve port, a valve member in said casing for controlling flow through said part, a two-part operating rod alined with and movably by said plunger and extending through said port, said valve member being screw-threadedly secured to one of the parts of said rod, said rod being separable and rigidly screw-threaded together for operation, a guide member carried by the other part of said rod and operable to hold said other rod part against rotation for separation of the rod parts whereby said valve member can be removed, and spring means acting through said rod in opposition to movement of said rod by said responsive material.

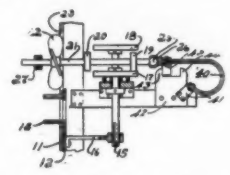
2,533,031. ABSORPTION REFRIGERATING SYSTEM OF THE UNIFORM PRESSURE TYPE. Charles A. Miller, Evansville, Ind., assignor to Servel, Inc., New York, N. Y., a corporation of Delaware. Application Dec. 8, 1947, Serial No. 790,367. 8 Claims. (Cl. 62—119.5.)

1. In a refrigerator, a refrigerator cabinet including a food storage compartment, a flue at the rear of said compartment and an insulated closure member therebetween, and a refrigerating apparatus for cooling said food storage compartment, said refrigerating apparatus



including a condenser within said flue and having a refrigerant vapor inlet and a refrigerant vapor and liquid refrigerant outlet, a pressure vessel within said closure member, an evaporator within said food storage compartment and having a liquid refrigerant inlet, conduits interconnecting said elements for flow of liquid refrigerant from the condenser to the evaporator, refrigerant vapor from the condenser to the pressure vessel and liquid refrigerant from the pressure vessel to the evaporator, and means including a portion of said closure member for cooling said pressure vessel, said pressure vessel being positioned within said closure member at an elevation below the level of the vapor and liquid refrigerant outlet of said condenser and above the level of the liquid refrigerant inlet of said evaporator, whereby condensate formed in the pressure vessel flows therefrom into the evaporator.

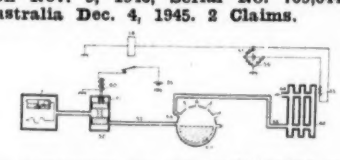
2,533,175. AIR CONDITIONING GRILLE. Alwin B. Newton, Dayton, Ohio, assignor to Chrysler Corp., Highland Park, Mich., a corporation of Delaware. Application Jan. 3, 1947, Serial No. 720,081. 15 Claims. (Cl. 236—1.)



2. An apparatus for controlling the admission of air to a room comprising a member having an air passage therein associated with a source of supply, a first means to restrict said passage, a second means substantially constantly driven by air supplied to said passage, a first driven member, a second driven member, a third means to transmit drive from either of said members to said first means, a fourth means to operatively associate said second means with said first member under a first set of temperature conditions and to operatively associate said second means with said second member under a second set of temperature conditions, said second means being adapted to drive said first member in one direction when associated therewith and to drive said second member in an opposite direction when associated with the second member whereby the movement of said first means is reversed for different sets of temperature conditions.

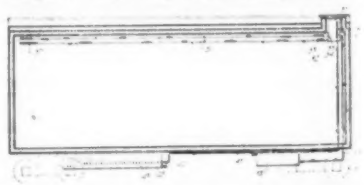
Week of December 12

2,533,407. HEATING AND COOLING SYSTEM. Thomas Samuel Skillman, Mosman, near Sydney, New South Wales, Australia, assignor to Punch Engineering Pty. Limited, Cammeray, near Sydney, New South Wales, Australia, a company of New South Wales, Australia. Application Nov. 9, 1946, Serial No. 709,044. In Australia Dec. 4, 1945. 2 Claims.



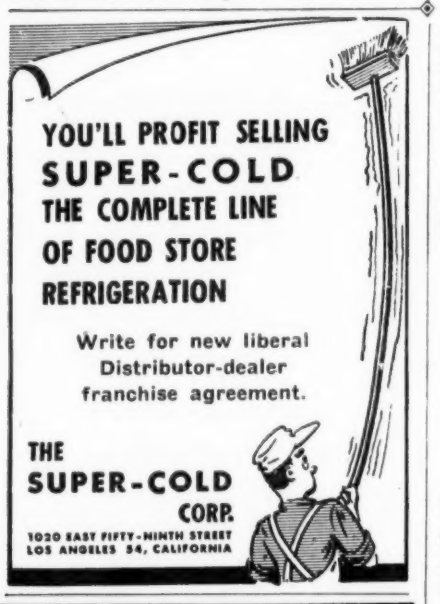
1. Apparatus for air-conditioning rooms and the like, comprising: radiation means having an effective area for absorbing heat radiation; air contact means having an effective cross section area for air passing over heat absorbing surfaces; means for adjusting the effective temperature of said radiation means, and means for adjusting the effective area thereof for absorbing heat radiation; means for adjusting the effective temperature of said air contact means, and means for adjusting said effective cross section area, each of said four adjusting means being adjustable independently of the others, said air contact area adjusting means comprising a valve chamber having an inlet and a plurality of outlets, opened in sequence by a rotatable valve element, within said chamber, and means connecting said outlets respectively to independent sections of said air contact means.

2,533,583. MOBILE REFRIGERATION UNIT. Harold C. Hopp, Des Plaines, Ill., assignor, by mesne assignments, to Frigid Transport Co., Inc., New York, N. Y.



1. A mobile refrigeration unit comprising a body mounted on wheels, a refrigerant holder and an absorbent holder supported by said body, an evaporator supported within said body, pipes for conducting liquid refrigerant from the refrigerant holder to the evaporator and vaporized refrigerant from said evaporator to the absorbent holder, means for regulating the flow of liquid refrigerant to said evaporator to maintain a predetermined liquid level therein, and means whereby the refrigerant holder and the absorbent holder may be periodically supplied with fresh refrigerant and absorbent respectively.

(To Be Continued)



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4-30-51

Low Temperature Systems

Factors In the Design, Selection and Servicing of Such Equipment

3. Advantages and Disadvantages of the Cascade System

This series of articles by Mr. Lopiccolo on low-temperature refrigeration covers the following ground:

Single, two, and three-stage refrigeration applied to low-temperature applications, with discussions of the principles involved in each type, and advantages and disadvantages of each type.

Service problems that are somewhat peculiar to these various types of systems.

Applications in which low-temperature refrigeration has a definite function. This covers many fields related to the defense effort.

This, the third in the series, describes the design and application of the cascade system.

Material appearing in this series of articles has formed the basis for papers which Mr. Lopiccolo has presented before a number of American Society of Refrigerating Engineers section meetings.

By Thomas Lopiccolo, Vice President, Bowser Technical Refrigeration, Division of Bowser, Inc.

We now come to the application of the cascade system and Fig. 4 shows the typical piping arrangement for this circuit.

It should be noted here that the cascade condenser is the key to cascade setup. This cascade condenser is a well-insulated heat exchanger where the one side is the evaporator and the other side is the condenser.

The heat absorbed by condensing the low stage refrigerant is manifested in the evaporation of the high stage liquid in the evaporator. This heat exchange is accompanied by an approximately 15° temperature difference between the two refrigerants.

In other words, in order to obtain heat throw from the condensing refrigerant to the evaporating refrigerant, it is necessary to have a temperature difference and this temperature difference has been established and is currently being designed at 10 to 15° F. It is this temperature overlap that is a lost refrigerating effect as far as the over-all system is concerned.

Among the advantages of the use of cascade systems is that it permits complete flexibility towards the use of different refrigerants resulting in a better selection of the refrigerant to do the job required. In other words, with the use of the low temperature for condensing the refrigerant within the cascade condenser, it is possible to use a refrigerant whose ordinary condensing pressure, considering the use of water as the condensing medium, would be too high and would be prohibitive, but if it can be condensed at a reasonably low pressure at a low temperature, then it can be used safely, provided the system is designed for overpressure when the system is shut down for any considerable length of time.

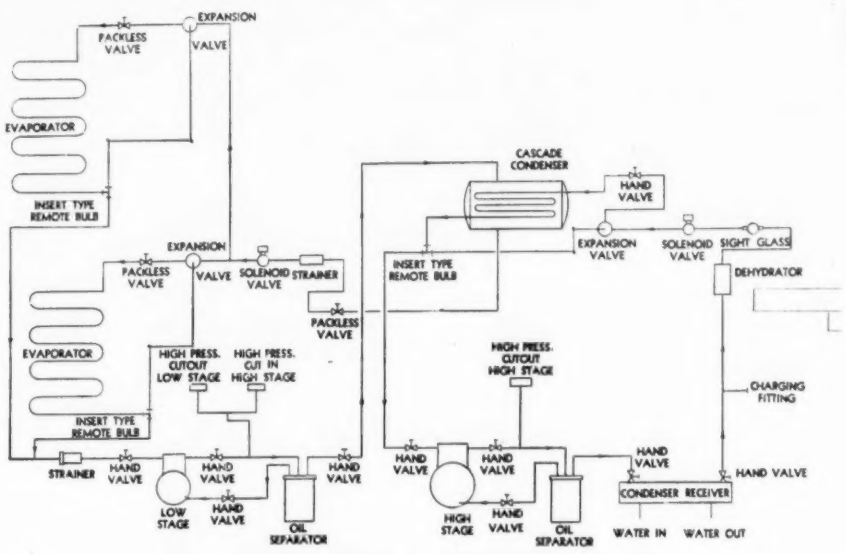

Fig. 4. Piping diagram for two-stage cascade system.

Another advantage is that each phase of the cascade system is identical to an ordinary single-stage system and does not require any knowledge of specially designed compressors or valve plates, gaskets, etc., for the operation and maintenance, service, and repair. Another advantage is that each expansion valve is rated to near its standard design condition. Operating pressures and comparison ratios are nearest normal as far as the valves are concerned and also as far as the condensing units are concerned.

There is very little difficulty with oil transfer since each system is self-contained and independent of each other. If each system is properly designed for oil return similar to any single-stage system, the oil will be retained in its proper place. Oil separators are as necessary here as in the previously described system.

And finally, one of the greatest advantages is in the fact that low temperatures are completely unlimited. Any number of cascaded stages are possible by the use of an additional cascade condenser and an additional stage of compression operating with a similar or new refrigerant gas. The only limitation that is imposed by extremely low temperatures is the selection of expansion valves to do the job required.

On some extremely low temperature applications, such as for the production of -200° or lower temperatures, it was found that expansion valves could not be used until they had been more properly designed and new power charges developed, and in these cases, capillary tubes and expansion orifices were used with excellent results.

Among the disadvantages of the cascade system is that the over-all efficiency is materially reduced due to the temperature overlap of 15° in the cascade condenser. Another disadvantage is that the initial cost of the cascade condenser is an appreciable item whereas in the previously described compound compression systems, there is no such expensive item in the system.

Another disadvantage is the possibility of trouble in the system due to the use of extremely high pressure refrigerants. This, therefore, results in the need for safety devices and protection against overpressure should the system be shut down and refrigerant gas allowed to expand to its normal pressure at atmospheric temperatures.

Another disadvantage is the limitation of control. In a cascade system, it is obvious that the refrigerant does not enter the expansion valve on the low stage system until it has been condensed to a liquid by the high stage machine. However, as soon as the liquid does seal the inlet to the expansion valve, it immediately produces an extremely low temperature in the evaporator.

In other words, at one instant there is no refrigerating effect whatsoever, and in the next instant, as soon as there is a liquid seal on the expansion valve, there is a tremendous refrigerating effect resulting in an extremely low temperature. If it is desired to control a temperature somewhere between the ambient temperature and the temperature of the expanding refrigerant, it is obvious that it would be very difficult to stop the refrigerating effect before it had dropped as quickly as 40° to 50° in one or two minutes.

Angier Made District Mgr. For General Controls Co.

GLENDALE, Calif.—General Controls Co. here has appointed Fred H. Angier as the new district manager for the Philadelphia and Baltimore factory branch offices, it was announced by J. F. Ray, vice president in charge of sales.

Angier, who moves from the position of branch manager in Baltimore to his new post, will include in his territory the District of Columbia, Maryland, Virginia, West Virginia, the eastern half of Pennsylvania, lower New Jersey, and Delaware. He will be based in General Control's Philadelphia office, located at 1238 Spring Garden St.

To succeed Angier, the company has appointed J. B. Crandley, a former sales engineer attached to the Philadelphia office, as the new manager of the Baltimore factory branch office.

Reports on MRO Quota Required Only of New Business Firms

WASHINGTON, D. C. — Business firms, government agencies, or public or private institutions which were in operation in 1950 need NOT make reports of quarterly quotas to NPA on materials used for maintenance, repair, and operating supplies (MRO), the National Production Authority emphasizes.

NPA made the explanation because some organizations, apparently misunderstanding Section 4 of Regulation 4, have gone to the unnecessary expense and bother of continuing to make reports. This is the regulation that permits the use of defense order (DO-97) ratings for procurement of MRO supplies.

Only new companies which were not in operation last year, or were only in partial operation, need make these MRO reports, NPA emphasized.

The procedure for new firms or institutions is this:

1. If the organization was in partial operation in 1950, it shall compute the amount it would have spent for MRO for the entire year had it continued at the rate it used the materials during the time it was in operation, making reasonable compensations to establish a fairly representative quota.

2. If a firm was not in operation at all last year, its quarterly MRO quota shall be the minimum amount of MRO which it determines to be reasonably necessary for its operation, but not to exceed $5,000 a quarter. If that is insufficient, the organization may make application for an increase.

3. If the quarterly MRO quota is in excess of $1,000, a new firm or one in partial operation in 1950 must, within 30 days after its first use of a DO-97 rating, notify the NPA of the quota it has established, the base period used, the method by which the quota was figured and any corrections made for seasonal or other factors.

'Package' Deal for Dealers on TV Sets Offered by Admiral

CHICAGO — A television-radio-phonograph package "promotion" aimed at cleaning out heavy factory and distributor inventories of TV receivers has been launched by Admiral Corp., with dealers being offered these special, temporary inducements to buy:

For every television console model retailing at $369.95 or more purchased from distributors, dealers will receive free a three-way radio-phonograph combination listing at $90.

The radio-phonograph will be supplied at $14.95, about one fourth of the wholesale price, if a dealer purchases any of three console TV receivers in the $350 retail price range.

For every console television receiver except model 27K-12 (a plastic console set) purchased on or after March 3 and now in store inventory, dealers can buy the radio-phonograph units at $29.95 each.

Wallace C. Johnson, vice president in charge of sales, said the offers cannot be called price cuts since they will be discontinued as soon as distributor inventories are cleared out.

Iron Fireman Moves Offices From Portland to Cleveland

CLEVELAND—Executive offices of Iron Fireman Mfg. Co. have been moved from Portland, Ore., to Cleveland, location of the company's main plant, it was announced recently.

The company, which also has plants in Portland and Toronto, manufactures automatic heating and power equipment.

Executives who will make their headquarters here include C. T. Burg, vice president in charge of sales; E. C. Webb, vice president in charge of research and development; and Lewis J. Cox, vice president in charge of public and employe relations.

FOR SALE
The following Carrier Equipment, all new:
2 7G8-579 50 HP
2 7G8-343 Belt Guard
2 39R7-127 Weathermakers
2 39R7-764 Coils 6-row DX
4 36R6-124 Weathermakers
4 39Q 6-764 6-row DX
2 9Q9-159A Evaporative Condenser
2 9Q9-623 Micromet
2 KH12FN-150 Strainers
2 27Q6-192 Fan Motor Cover
2 9Q6-753 Pump Motor Cover
1 7G8-494 Repl. Compressor Accessories
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FOB Elizabeth, N. J.
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SILVER SOLDER TORCH & KIT
Joins All Metals Permanently
Equal to Welding for Most Purposes

Excellent for refrigeration service men. KIT includes one tube silver solder flux and 10 5-in. lengths (total 50 in.) silver solder alloy. Hottest ALCOHOL TORCH known. 2700° F. flame. Operates in any position, indoors or out. **Torch alone $5.50. Kit alone $1.50. Kit alone with 200 inches of silver solder alloy $4.50.** Complete instructions included. Add 25¢ on each order towards shipping charges.
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the tool that both **FLARES and BURNISHES TUBING**

Makes Stronger Flares
Does Not Score Tubing
CONTROL KNOB FOR BURNISHING
3 rollers in spreader cone roll out the flare
See Your Jobber
IMPERIAL ROL-AIR® FLARING TOOL
ROLLS FLARES IN THE AIR. Gives them a highly burnished finish which assures tighter joints. Flare is not formed against die block but is rolled out with tubing extended above die block face. Flares soft copper, brass and aluminum tubing.
No. 355-F Imperial Rol-Air Flaring Tool. Flares 1/4", 5/16", 3/8", 1/2", 5/8" O.D. Tubing $9.85
THE IMPERIAL BRASS MFG. CO.
1200 W. Harrison Street, Chicago 7, Illinois

CLASSIFIED ADVERTISING

RATES for "Positions Wanted" $5.00 per insertion. Limit 50 words. 10¢ per word over 50.

RATES for all other classifications $7.50 per insertion. Limit 50 words. 15¢ per word over 50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other addresses by actual word count. Please send payment with order.

POSITIONS WANTED

EXECUTIVE WITH extensive experience in the refrig., heating, and air cond. industry, presently employed, would consider position with well established corp. or company. Personal qualifications: Right age. Wide acquaintance in industry. Aggressive and ambitious. Abilities: Assume hvy. responsibilities, sales management, organizational, promotion, ingenuity and ability to deal with people. Write BOX 3713, Air Conditioning & Refrigeration News.

SALES AND service, fifteen years' experience all types commercial, industrial and air conditioning. Five years service manager for largest service company in midwestern city. One year, factory service engineer, two years factory district sales manager. Looking for permanent home with manufacturer or distributor. BOX 3721, Air Conditioning & Refrigeration News.

POSITIONS AVAILABLE

COMMERCIAL REFRIGERATOR salesman. Must be familiar with Hussmann or similar equipment, able to figure own jobs and handle store layout. Excellent opportunity with progressive organization. Salary and commission. Also have opening for competent wholesale man. Give complete details background and experience. ZEROZONE HOUSTON COMPANY, INC., 1120 Wood St., Houston, Texas.

WANTED: MAN with tested commercial cabinet and designing engineering experience. Must be graduate BSME or experienced equivalent with actual metal layout and executive drafting tooling background. Salary mid to top four figures. Furnish complete resume of education, employment experience, personal qualities and general information. Real opportunity for man age range 30-45. Small town—desirable living conditions. Splendid opportunity for advancement to executive group. Please write BOX 3719, Air Conditioning & Refrigeration News.

EQUIPMENT FOR SALE

REFRIGERATOR DOORS. 3'6" by 6'6" double batten auto close doors complete with removable track heads for a 7'2" track. 1½" corkboard insulation. 16 gauge metal clad. Brand new. $95.00 each. Freight prepaid in U.S. Door height will be altered for anything up to and 11 ft. 2 in. track for $15.00 additional. BIMEL CO., Cincinnati, Ohio.

COMPRESSOR BODIES, brand new; model #19 good up to 1-HP, @ $38; includes flywheel and service valve. The last of a large quantity. First come, first served. MANN REFRIGERATION SUPPLY CO., 15 Astor Place, NYC, GRamercy 3-8000.

¼-HP 0-25 prominent brand condensing units complete; brand new; limited quantity; act now; $52. each FOB New York; write for specifications; other sizes also available; MANN REFRIGERATION SUPPLY CO., 15 Astor Place, New York 3, N. Y.

CAN YOU use ¼-HP low-temperature model L2M units at $52? Also other sizes. Write for literature and specifications. NEW YORK REFRIG. CO., 35 [illegible] Fourth Street, New York, N. Y.

FOR SALE—while they last—standard makes—new hermetic units—static & fan-cooled cond. ⅛, ⅙, ⅕, ¼, ⅓. Open Units—¼—⅓—½. Relays—⅛—⅙—⅕—1/12—also overload protectors. #673 Methyl T.X.V. Capacitors in jet-black steel case 190-240 mfd. Small hermetic driers. ¼" fl.—7½" overall Driers. Household Cold Control—w/Knob & plate. Also other parts and supplies. Send for our latest list and prices. Sold on money back guarantee. WALTER W. STARR, 2833 Lincoln Ave., Chicago, Ill.

BUSINESS OPPORTUNITIES

FOR SALE—Refrigeration and coin machine business, modern home. 50 coin machines on location in north central Wis. resort city. Population 10,000 in 20 mile area, no competition. This is a combination showing a better than average income. Owner entering hospital. Box 296, Crandon, Wis. Phone 80.

SCHOOLS

VETERANS ATTENTION: Enroll in the school of your choice before the July 25 deadline. For men engaged in or who would like to become engaged in any phase of air conditioning, refrigeration, heating, ventilating, heat pump engineering or sheet metal work, classes before the July 25 date start April 24, June 5 and July 17. Write for catalog. DETROIT AIR CONDITIONING INSTITUTE, 4258 Woodward Avenue, Detroit 1, Michigan.

MISCELLANEOUS

NORGE SEALED units remanufactured and exchanged. Immediate delivery from stock, 1 year warranty. Write for prices and shipping instructions. Genuine Norge terminals for Norge sealed units. Complete set of three, $1.45 plus postage. MODERN REFRIGERATION CO., INC., 12541 E. McNichols Road, Detroit 5, Michigan.

NORGE SEALED units—remanufactured and exchanged. All SO_2 units converted to "Freon-12." Factory methods are used, and all work is supervised by Norge factory trained men. For additional information and prices write NORD HERMETIC COMPANY, 1701 San Leandro Blvd., San Leandro, California.

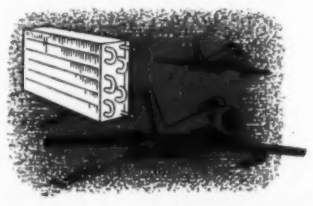
Let's give them the Best we've got

Hospitals, Laboratories, Defense Plants and the Armed Forces themselves need REFRIGERATION and AIR CONDITIONING EQUIPMENT NOW!

These are critical days. Any reduction in sales effort, in the complacent belief that the present mobilization will stimulate business automatically, may well lead to disaster. Now, more than ever before, refrigeration and air conditioning equipment plays a vital part both on the battle front and at home. The last war proved its necessity! Aluminum and copper are essential requirements for this "life-line" equipment. Let's not sacrifice quality. Let's give them the best we've got!

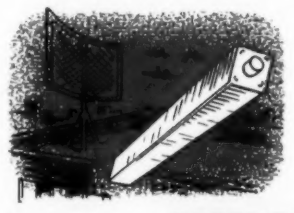
Typical applications of the products of this "life-line" industry are shown below. Bush Engineers supplied much of the "know-how" and pioneered considerable of the development which made many of these applications possible.

JET PLANE CABINS



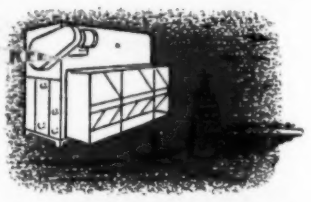
All aluminum air conditioning coils make jet plane cabins "liveable" . . . make it possible for a pilot to withstand the rigors of supersonic flying.

RADAR AND ATOMIC ENERGY



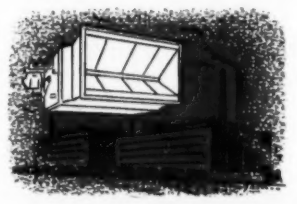
Accuracy and control require constant temperatures, proper humidity. In both radar and atomic energy fields, heat transfer plays an important part.

SHIPS AND BASES



Steering gear rooms of battleships to refrigerated walk-in coolers of army bases — all vital spots — all require air conditioning and refrigeration.

DEFENSE PLANTS

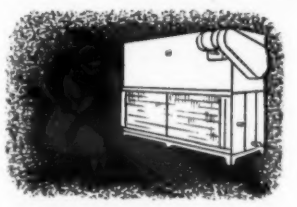


Air cooled aftercoolers for air compressors to air conditioned working areas for personnel, all designed to furnish better products, in a shorter time.

ARMY AND NAVY CAMPS

Food must follow the route of a fighting man. Panel coolers attached to a section of a cooler wall permit rapid assembly of a complete walk-in-refrigerator.

STEEL PRODUCTION



From 40% to 50% more steel is produced by blast furnaces fed with dehumidified, filtered air. The coke required per ton is reduced while the quality of the product is improved.

FRESH FOOD IS A "MUST" FOR OUR ARMED FORCES

Eleven of the thirteen army daily rations require refrigeration. Portable walk-in refrigeration units do the job. Ships require cooling units for food . . . in shipment and for personnel. And here at home, with the potential threat of disruption of our distribution lines from atomic bomb attack, more and more refrigerated warehouses will be required to provide food storage facilities in all areas.

These are only a few of the many, many uses of refrigeration and air conditioning equipment. Others include, for example, the chemical, petroleum, rubber, pharmaceutical and aircraft industries . . . all vital defense applications. And for the best in refrigeration and air conditioning equipment . . . buy Bush. Insist upon the expert design, careful testing, rigid quality control and modern production methods which are an integral part of every Bush product . . . and manufactured in the newest and most up-to-date plant in the entire industry.

Buy the Best-and the Best is

BUSH

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